Co-residential group composition and the spatial design of residences: an investigation using the ethnographic and archaeological records

Eleni Theodora Romanou

Thesis submitted for the Degree of Doctor of Philosophy, UCL (University College London)

I, Eleni Theodora Romanou, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

VOLUME 1

TEXT

ABSTRACT

It is widely accepted that socio-cultural considerations play a significant role in the design of residences; yet the role played by the occupantsô demographic characteristics can only be guessed at through fragmentary or anecdotal evidence. This research brings together a large body of secondary ethnographic data with the aim of exploring, in a systematic fashion, whether differences in the composition of co-residential groups find expression in the size and internal layouts of residences. It also seeks to determine whether the composition of groups can be inferred on the basis of architectural plans. If so, this approach could be of service in the social interpretation of archaeologically excavated residences.

Part I of the thesis reviews the cultural, demographic, economic and political factors which influence the composition of co-residential groups.

Part II explores the ethnographic corpus. This consists of architectural descriptions of 368 residences from 14 settlements situated in different parts of the world, together with demographic descriptions of their respective co-residential groups. Selective case studies are used to demonstrate that spatial factors can constrain and influence group membership. The entire corpus of residences is then analysed, and a number of spatial and architectural features identified which can point to the demographic characteristics of the groups in occupation.

Finally, Part III considers the extent to which those findings can serve in the reconstruction of ancient co-residential groups. A number of ancient domestic contexts are investigated, ranging from an exceptionally well preserved historical setting (Roman Pompeii and Herculaneum) and a proto-historic setting (Iron Age Israel), to a comparatively modest prehistoric setting (Bronze Age Cyprus). The transformational processes that residences and their contents undergo during and after abandonment, and the obstacles they present to the detection of key architectural features, are dealt with in detail in the case of the Cypriot sites.

TABLE OF CONTENTS

VOLUME 1

PART II: The Ethnographic Record

PART III: The Archaeological Record

VOLUME 2

LIST OF TABLES

LIST OF FIGURES

ACKNOWLEDGMENTS

I am grateful to the Arts and Humanities Research Council for a Postgraduate Award which funded three years of my research (2001-2, 2003-4, 2004-5); to the A. G. Leventis Foundation for the award of an Educational Grant during the academic year 2001-2, and its renewal during the subsequent two years; and to the UCL Graduate School for the award of a Research Scholarship for Cross-Disciplinary Training, which allowed me to spend one academic year (2002-3) during the course of my PhD studies at the Bartlett School of Architecture (UCL).

I thank my supervisors, Professor Todd Whitelaw and Dr Andrew Bevan, for their invaluable guidance throughout my studies. I also wish to acknowledge and thank the following: Dr Mark Lake for his role as my second supervisor before going on sabbatical in 2003; Dr Cyprian Broodbank and Dr James Conolly, for taking an active interest in the early stages of my work, and the latter for referring me to relevant publications; and Professor David Frankel and Dr Jenny Webb, who kindly sent me advance copies of an article they later published in Antiquity (2006a) and of the final chapter of their excavation report on Marki-*Alonia* (2006b). Thank you also to all those who helped me understand the direction I wanted to take this research: Chris Romanos, Stella Bolonaki, my mother, my grandmother, and Sam Griffiths.

I am deeply grateful to the family and friends who supported me when I came back to my research after a long break, and to my husband for his unfailing patience and support, his well-reasoned advice, his proof-reading skills, and his calm and knowledgeable manner of dealing with recalcitrant technology.

CHAPTER 1
Introduction

1.1 Research questions

We take certain things for granted regarding residences and their occupants: that people should inhabit their homes without feeling cramped, and that no one should be forced to share space with persons whose proximity they consider inappropriate. In Britain this has long been made explicit in law: the 1935 national statutory overcrowding standards define certain living arrangements as unacceptable because they involve too many people, or unmarried people of opposite sex, sharing residential space (Housing Data and Statistics, 2004). The very existence of these standards attests to a widely held expectation in modern British society that residences can accommodate certain households and not others, depending on their size and layout.

Today, overcrowding is determined not only on the basis of the total population of the household but also with reference to the age, sex and marital status of individual household members (London Housing Briefing, 2004).[1] Inherent in the notion of *overcrowding* and the way it is defined is the understanding that any given configuration of occupants has specific spatial requirements that their residence is expected to satisfy. The frequency of overcrowding in England in recent years ï amounting to no more than three per cent of households when measured against the ôbedroom standardô (Housing Data and Statistics, 2004; Department for Communities and Local Government, 2010) ï demonstrates that, by and large, residences fulfil that expectation, and particularly so outside the social and private rented sectors.

From this it may be hypothesised that, in other societies too, the layouts of most residences are likely to ôfitô the demographic characteristics of the set of people who occupy them.

But what does the ôfitô entail in different cultural settings? Is there a shared understanding across cultures that, say, female residents of a certain age should sleep separately from males; that married couples are entitled to privacy; or that more space is

[1] The two measures used to determine over-crowding and under-occupation in the 2001 census were ôpersons per roomô and the ôoccupancy ratingô. The latter is calculated on the basis that each residence needs at least two common rooms plus one purpose-built bedroom for each cohabiting couple, any lone parent, anyone over the age of sixteen, any pair of ten- to fifteen-year-olds of the same sex, and various combinations of younger persons (Office for National Statistics, 2004). Broadly similar is the widely-used ôbedroom standardô, developed by the Government Social Survey in the 1960s, which assumes the provision of separate bedrooms for every cohabiting couple and for any person over the age of twenty-one, and gender segregation when there are children over the age of ten, with no more than two persons sharing each room.

required by adult residents than by young children? Does a particular configuration of occupants therefore require the same number of rooms and same amount of space in any cultural setting?

Answers to these questions are not readily available. Cross-cultural research on residential occupation density does exist, and it is interesting to note that raw figures show the existence of differences between societies (Naroll 1962; Brown 1987: Table 2). However, such aggregate measures are calculated using community-wide averages for household size and for the habitable area of residences, and so mask how much space is taken up by individual categories of household member, or by households of particular composition. To determine what a ócomfortable fitô between a residence and its occupants means and how its meaning differs from one social context to another requires data on a finer scale, and a demographic description of households which goes beyond mere enumeration of their members.

Data of this kind can be found in several anthropological studies of ótraditionalô housing in Africa; these examine how variation in household composition is manifested in residence plans and areas (Goody 1971 (originally 1958); Lebeuf 1961). Other studies bring together information from three or four societies (e.g. Schwerdtfeger 1982; Oswald 1987): comparisons are used to draw out the significance of modes of tenure, construction costs, and other practical factors in enabling occupants to maintain the ófitô between their spatial needs and the layouts of their residences.

Yet studies such as these have made little of the opportunity to explore whether households that have the same composition but belong to different societies use comparable amounts of living space. Moreover, none have established whether distinct societies are alike when it comes to allocating sleeping accommodation to different categories of occupant, as defined by their age, sex, marital status and kinship links with other residents.

A number of studies conducted in the ethnoarchaeological tradition have given explicit, if sometimes brief, consideration to the way select architectural attributes of residences relate to aspects of household composition (David 1971; Watson 1979; Jacobs 1979; Kramer 1982; Wilk 1983; Kamp 1987; Tobert 1988; Horne 1994; Aurenche et al. 1997; de Pierrebourg 1999). Some of the insights generated by these studies have appeared in academic literature reviews (Lawrence and Low 1990: 462f.; David and Kramer 2001: Chapter 10). Nowhere, however, have they been synthesised in such a way as to offer an

understanding of cross-cultural regularities or cultural differences in the spatial requirements of households of particular size or demographic make-up.

This is particularly surprising given ethnoarchaeologyôs raison d'°tre: namely, to transfer understandings from societies which can be studied in detail to other, less well known societies. Ethnographic observations are made in living communities to provide analogies with which to interpret material from ancient communities; comparison across living cultures and the search for uniformities would therefore enhance the value of ethnoarchaeological observations, by establishing the contexts and conditions where they can or cannot be applied.

How the ófitô between a residence and its occupants compares between cultures is an interesting and under-researched issue, but another matter to consider is precisely how close the ófitô is. Is the relationship between the design of a residence and the household it accommodates sufficiently close to allow facts about households to be deduced from information about the residences they occupy? If such a relationship does, in fact, exist, this would be good news for archaeologists: it would mean that the area and layout of an ancient residence could help diagnose some of the occupying householdôs demographic characteristics. The residenceôs spatial attributes could perhaps even point towards a particular configuration of occupants.

This is an intriguing prospect, and one that deserves further investigation. In this connection, it is also worthwhile looking into how the relationship between buildings and their occupants comes about. It may be reasonable to assume that people build residences tailored to their spatial requirements; but might it also be the case that residence design sometimes takes the lead, in other words that people that have settled into a residence keep a check on their numbers and the demographic composition of their household in order to maintain a satisfactory ófitô with its existing layout?

Social research into co-residence in China between parents, on the one hand, and their adult or married children, on the other, suggest that this may be the case (Logan et al. 1998; Logan and Bian 1999). There is a statistically significant link between the incidence of co-residence and the size of residences, whether measured by floor-area or by number of rooms: unsurprisingly, adult and married children are significantly more likely to take up residence in their parentsô apartment if it is relatively spacious, and significantly more likely to take a parent or parent-in-law into their own home if there is sufficient room available. At least in this case, then, spatial circumstances do appear to be taken into account when people decide when and when not to co-reside.

But how crucial is space as a criterion for such decisions? What other factors influence the demographic composition of households, and are these more important than the availability of space within the residence? Though there is a great deal written by historians and anthropologists on the subject of household formation, the role of space is often overlooked. Our understanding of the way in which households acquire and change their demographic composition would undoubtedly benefit from probing this further.

This research project has been built around the questions and issues outlined above. It deals with the relationship between residential space and household composition by recognising some of the biases in the existing literature and plugging gaps regarding: the particular *role of space* in household formation; a *cross-cultural perspective* on the ófitô between the design of residences and their occupants; and the delineation of this ófitô by reference to household demographics *other than population size* (in contrast to many existing studies e.g. Naroll 1962; Ember 1973).

1.1.1 Aims and value of the research

The research has three primary aims, starting with the following:

Objective 1: to explain how households in various cultural contexts form, and how they change their composition ï and especially what role space plays in this;

and

Objective 2: to determine whether basic demographic characteristics of households can be inferred from the spatial attributes of their residences.

Both theoretical and practical value can be drawn from fulfilling these objectives. For example, the research can serve as background information for housing studies, particularly any that have to do with multicultural or non-European societies. One proposition made in the early chapters of this thesis is that custom plays a significant role in decisions concerning living arrangements, and that the demographic characteristics of households may therefore be linked to the occupantsô customs and traditions. On the other hand, households are sometimes prepared to alter their composition expediently to suit their personal circumstances and the spatial opportunities available to them. Taken together, these understandings can inform the design of housing for households of different ethnic origin; they might also be pertinent

to the culturally sensitive allocation of social housing to members of minority ethnic communities in multicultural societies (cf. Kempson 1999).

For archaeologists there may be a more practical application: using the spatial attributes of excavated residences to infer the demographic characteristics of ancient households. This possibility is explored in some detail in the later chapters of this thesis, and forms the third objective of this research project:

Objective 3: to establish whether the insights developed from ethnographic research are useful for deducing household demographics from the archaeological record.

1.2 Sources and approaches used in the research

Meeting the projectôs objectives requires background information, theoretical concepts, and data from a range of sources. The most crucial of these can be placed into three categories.

- Anthropological and historical writings on óthe householdô, and empirical studies of households conducted by anthropologists and family historians. This information has been gathered from journal articles, books, and conference proceedings, and arranged into a series of thematic literature reviews.
- Ethnographically recorded data on residences and their occupants. Records from a range of ethnographic sources have been collated to form a corpus of 368 households and privately owned properties, from 14 communities.
- Studies of ancient residences written by archaeologists, and archaeological evidence of residences and their contents, drawn from a variety of excavation reports, journal articles, and published monographs.

It is important to point out that none of the aims can be met by exclusive reference to only one of the categories of data listed above. Nevertheless, for the sake of convenience this thesis has been structured into three parts, each corresponding to one of the three categories and arranged in the sequence outlined above.

This structure has several advantages. For one, the reader has the chance to familiarise themselves with the concept of household formation from a broad, multidisciplinary, and multi-cultural perspective (in Part I), before being presented with the idiosyncrasies of particular ethnographic case studies (in Part II). Another, quite considerable, advantage is that complications that regularly beleaguer archaeology (to do with data quality and

methods of interpretation) can be temporarily kept to one side during the empirical investigation of the relationship between residences and their occupants (in Part II). These inherently archaeological considerations are dealt with in their own right in Part III of the thesis.

The remainder of Section 1.2 explains the reasoning behind the choice of sources featured in Parts I, II and III of the project. It also sets out the ways in which this information is used in the chapters that follow.

1.2.1 Part I: the literature of anthropology and family history

Although households have been a subject of study in various academic disciplines, it is the research of anthropologists and family historians that is responsible for the greatest advances to our understanding of how people end up living in configurations of one type or another. Aspects of this research owe much to the ideas and methods of sociologists and historical demographers (Hareven 1971,1991; Stone 1981); while insights resulting from it have been shared by the anthropological and historical academic communities (Yanagisako 1979; Netting et al. (Eds.) 1984; Kertzer 1984) and have subsequently fed back into several disciplines, including sociology (Cherlin 1983), demography (Burch 1979) and archaeology (Wilk and Rathje 1982). Given its broad basis and its cross-disciplinary influence during the 1980s, the literature on ôhouseholdsô, ódomestic groupsô and ófamiliesô from anthropology and family history is a fitting source from which to distil the principal theories surrounding household composition.

From this extensive literature, Part I of this project picks out a variety of concepts relevant to the membership, formation, and compositional transformation of households.

It uses these, first and foremost, to develop the terms and operational variables necessary for talking about and tackling the issues with which this thesis is concerned. For example, a classificatory scheme used in the quantitative branch of family history research to describe household composition (Laslett 1972: Table 1.1; Hammel and Laslett 1974) is adapted to take account of the spatial concerns of the research. The notion of the developmental cycle shared by anthropologists (Fortes 1971 (originally 1958)) and family historians (Berkner 1972) is also considered and critiqued in Part I, giving rise to the óresidential patternô, a key concept in the present thesis.

The literature can also be used to take stock of all the factors that are known to influence the membership of households. By way of introduction, two general trends may be

mentioned here: anthropologists (and household economists) typically focus on considerations of efficiency and cost-effectiveness that guide órationalô decision-making at the level of the individual or household, while family historians pay more attention to the impact of politico-economic forces and other, usually macro-level, social and material conditions.

The first tendency is exemplified by Pasternak et al. (1976), who proposed that the formation of so-called óextended family householdsô in certain settings is necessitated by the scheduling demands of domestic tasks. One reason why economic considerations take centre stage in anthropological accounts stems from the choice of the term ôhouseholdô or ódomestic groupô to refer to people who occupy the same residence. Such terms imply that co-operation, communal consumption, or shared budgets and financial interests *must exist* between co-residents. Indeed, in a landmark collection of anthropological and historical studies on ôhouseholdsô (Netting et al. (Eds.) 1984), most contributors took as a starting point a common conception of the ôhouseholdô (Netting et al. 1984: xxviii) which explicitly listed various such relationships as defining criteria (Wilk and Netting 1984). Yet it may be argued that any term that emphasises the existence of economic relationships between co-residents effectively steers the investigation of why people choose to live together into a search for economic rationalisations. Use of an economically loaded term risks eclipsing the influence of other factors, and the view taken here is that it is best avoided.

At this stage, therefore, the term óco-residential groupô is put forward as a more neutral ï and, as such, a more appropriate ï way of designating a collection of people who live together. By defining a group solely on the basis of shared occupation of the same residence[2], any economic as well as genealogical or emotional relationships which exist between its members become de-centred, and may themselves become a target for enquiry.

Thus, a co-residential group consists of *every person* accommodated by a particular residence. Any other links which exist between those persons play no part in the definition, but their nature and frequency should be explored and brought to bear in explanations of the groupôs formation (cf. Verdon 1980). The term is borrowed from Donald Bender who long ago pointed out the logical distinction between co-residence, kinship, and domestic co-operation, and referred to social groupings according to the particular relationship shared by their members (Bender 1967).

[2] For a precise definition of óresidenceô, as used in this project, see section 4.3.

Excluded literature

One consequence of re-framing the issues raised in section 1.1 in terms of ôthe co-residential groupô is to render as irrelevant anything in the literature that deals with social groupings whose members are not linked by co-residence.

This applies to qualitative studies of ôthe familyô carried out by traditional cultural historians, which are typically aimed at capturing peopleôs cultural attitudes towards their relatives (co-resident or otherwise), understanding their kinship networks, and tapping into the emotional character of their relationships (e.g. Anderson 1971; Stone 1977). Likewise, we may set aside family history studies that employ the ôlife-course approachô (Hareven 1991: 96f.), which, rather than focusing on co-residential groups, track birth or marriage cohorts through their different life stages.

Much of the existing literature, however, remains useful. A prevalent type of family history research in the 1970s and 1980s was based on the analysis of census records using the quantitative methods pioneered by Laslett and the Cambridge Group for the History of Population and Social Structure (Laslett and Wall (Eds.) 1972). Such studies treat the ôblocksô of names that appear in historical census records as people who lived at individual addresses and regularly shared meals (Hajnal 1982: 481). While textual evidence of any form of interaction between the named people is almost never available (Berkner 1975: 726), causing some scholars to dismiss such groups as ñnot very meaningfulò (Stone 1981: 64), many researchers acknowledge the ambiguity but are content to interpret the ôblocksô as lists of people who lived together (Berkner 1975; Hammel 1984). Admittedly, these ôblocksô may not always represent complete co-residential groups but may instead consist only of select occupants (most probably, those who ate together or ate from the same stock of food); but to assume this of all census records would be both unwarranted and wasteful of a valuable resource. In keeping with this large body of research it is assumed here that ôblocksô of names in historical census records are equivalent to, or coterminous with, the members of co-residential groups.

Turning to the anthropological literature dealing with ôdomestic groupsô or ôhouseholdsô, by and large these too seem to refer to co-residential groups. In the absence of any detailed description of the accommodation of such social groupings ï an omission typical of this body of work ï it is almost always impossible to verify that their members actually share single residences. For the purposes of this thesis, however, unless there is

any indication to the contrary[3], ódomestic groupsô and óhouseholdsô are assumed to correspond with co-residential groups.

Uses of historical and anthropological literature

The value of historical and anthropological research lies in different areas. Family history covers a wide spectrum of communities, characterised by extremely diverse social and material conditions. This has been particularly true since the mid 1980s when efforts were made to expand the geographical scope of the field (Kertzer 1985). Through this research we may come to appreciate the role played by different laws and institutions, community-wide demographic trends, and politico-economic systems in shaping the composition of co-residential groups. Meanwhile, the approach used by anthropological researchers is valuable in provoking a thoughtful assessment of economic considerations (micro-economics) and the role of social reproduction in bringing about, maintaining, or dissolving co-residential arrangements.

Part I discusses these diverse elements and the influence of socialisation in guiding óresidential decisionsô: the actions and strategies which directly affect the membership of oneôs co-residential group, such as the decision to remain in oneôs natal group upon marriage or to leave and join another group.

What is almost entirely missing from both bodies of work is consideration of how group membership is affected, if at all, by the availability of space (in terms of the size and layout of residences). With regard to family history, this omission could be put down to the dearth of architectural plans and other historical documentation relating to housing. Anthropologistsô lack of interest in residences, on the other hand, is symptomatic of the disciplineôs broader tendency to neglect architecture (cf. Humphrey 1988).

The upshot of this omission is that the influence of spatial circumstances in shaping the composition of co-residential groups ï a question which was highlighted in section 1.1 as being of particular interest ï cannot be ascertained without looking at other sources. In the absence of any systematic discussion on this topic by historians or anthropologists, what is required is raw data on residences and their occupants from a variety of cultural contexts. Taking as a starting point the terms, operational variables, and theoretical understandings developed in Part I, this raw data can be used to investigate how spatial factors affect the composition of co-residential groups.

[3] In his writings on the Ashanti, Fortes describes one famous instance of this (Fortes 1949). Amongst the Ashanti, individuals can belong to the same ódomestic groupô as their spouse but reside separately, and are therefore not part of the same co-residential group.

1.2.2 Part II: the ethnographic record

There are various ways to amass data about residences and the demographic characteristics of co-residential groups, but not all are feasible for a research project of this scale. The time, costs, and resources required to carry out fieldwork in multiple cultural contexts, for example, rule out the collection of primary data. Various national-scale random-probability social surveys, such as the English Housing Survey, have already collected high-quality cross-sectional data of a type relevant to this study. However, the difficulty of finding equivalent data sets from various countries, harmonising the definitions of the variables, and managing the sheer volume of the data involved, outweighs the potential benefits of using these sources.

Given these difficulties, the ethnographic record emerges as the most suitable source of data for tackling the first two aims of this project. Of course ethnographic, ethnoarchaeological, and ethno-architectural fieldwork is conducted with a host of different aims in mind, and often does not involve the collection of the types of evidence required for the purposes of the present study. Yet some fieldwork reports do contain detailed information on the demographic characteristics and accommodation of co-residential groups from individual communities. This is normally compiled by ethnographers through a combination of participant observation, and interviews with key informants and heads of co-residential groups in their host communities. Such data sets are often small, but evidence from a number of communities may be brought together to form a sizeable and varied cross-cultural sample, permitting secondary analysis at the level of the co-residential group and residence, as well as at the level of the community and settlement.

A database compiled in this way has certain merits that need to be spelled out before going any further.

Advantages and disadvantages of this approach

The inclusion of any co-residential group and residence in the dataset is conditional, first and foremost, on an ethnographer having chosen to study the community (or part of the community) to which it belongs. The dataset therefore constitutes a non-random convenience sample; it cannot be considered representative of co-residential groups and housing across the worldôs cultures. As such, it is subject to a basic limitation: statistical findings from the sample cannot be generalised to a wider universe (McNett and Kirk 1968).

In fact, any sample of nations or communities selected for cross-cultural research is inevitably unrepresentative of the universe of human cultures, since the extent and nature of the latter is not known. Cross-cultural research carried out in recent decades with the aim of generalising about human societies (Burton and White 1987) has often employed samples comprised of pre-selected units, such as Murdock and Whiteôs standard sample (Murdock and White 1969) or Narollôs Human Relations Area Files probability sample (Naroll 1967). There, the analytical units ï referred to as ófocal communitiesô ï at least have the advantage of being deliberately varied and mutually independent (which is to say that they do not share a common history or other connections).

Because these standardised samples contain data solely at the level of the community, their use is not recommended here. Instead, in this thesis observations about individual co-residential groups have been compiled from various ethnographic sources, resulting in a customised sample which lends itself to analysis at the community level as well as finer resolution analysis. The customised sample resembles standardised samples in that it, too, is designed to be diverse.

This has certain benefits. The existence of diverse geographical, cultural, political and socio-economic conditions means that it is improbable that any phenomenon would emerge consistently across the sample due to chance alone; regularities that span the entire corpus would therefore be surprising, and provide some grounds for hypothesising the existence of the same phenomena in many, or even all, other societies. Moreover, because the key differences and similarities in the circumstances of the sampled communities are known, it is possible to isolate the probable reason why a particular phenomenon occurs in some contexts and not in others, and establish the conditions under which pairs of variables correlate with one another.

The customised sample consists of 368 residences and co-residential groups drawn from 14 different communities. As already stated, these do not constitute a representative microcosm of the worldôs co-residential groups, nor do they reflect all possible variations in housing. Instead, the sample should be appreciated for what it offers: a convenient empirical focus for exploring concepts about co-residential group composition and its relationship to residential architecture, and for stimulating theoretical discussion on these topics.

Part II of this project takes advantage of the sampleôs major strengths ï its diversity, and the fact that it allows analysis at the community and co-residential group levels ï to

address two of the aims outlined in section 1.1. The research includes case study and cross-sectional design components.

Uses of the ethnographic record

The projectôs first aim is to understand how co-residential groups form and change their composition, and what part spatial considerations and circumstances play in residential decision-making. To this end, three cases are extracted from the sample: three communities whose entire population of co-residential groups and entire housing stock have been surveyed. Each setting provides a rich and complex data set from which to tease out the factors which could best explain the residential decisions of their inhabitants.

The projectôs second aim ï determining whether the demographic characteristics of co-residential groups can be inferred from the spatial attributes of their residences ï requires the use of the entire corpus of co-residential groups and residences. The whole sample is examined for links between demographic and spatial variables. The investigation relies mostly on a deductive approach: hypotheses are proposed in favour of the presence or absence of a particular association, and empirical evidence from one or more of the settlements offered in support. Alternatively, a statistically significant association between co-residential group composition and a certain spatial attribute is detected across the whole sample, or in some of the sampled communities but not others, and hypotheses are suggested to explain it. The process of tacking to and fro between theoretical discussion and the data allows us to discern the logic behind the linking of pairs of variables in the sample, and the circumstances required for an association to hold true.

From the above, we can go on to generalise about residences and co-residential groups not included in the sample. Crucially, the ability to generalise is not born directly from statistical analysis of the sample, but from theoretical arguments which are either tested by means of the data or inspired by that data. Thus, the value of the sample is in generating conceptual generalisations that are transferable to other contexts. The question of whether they are also transferrable to ancient contexts is dealt with separately, in the subsection below.

1.2.3 Part III: archaeological literature and the archaeological record

Building on the conclusions from Part II of the thesis, Part III explores whether the composition of co-residential groups can be inferred from the architectural attributes of excavated residences. One might expect a range of approaches to already exist within

archaeology for exploring co-residential group composition. In fact, surprisingly little interest has been shown in the demographic characteristics of groups, even within the field known as ‘household archaeology’.

In her overview of research in this field, Steadman (1996: 54), described “economic reconstruction” as the main preoccupation of ‘household archaeology’, with

> [some studies addressing] the issue of social and economic organisation within the household… while others concentrate on wealth differentiation and class stratification as seen within and between households and houses (ibid. 57).

An emphasis on the economic characteristics of ‘households’ was actively encouraged in the early 1980s when the field was initiated in a now-famous article by Wilk and Rathje, which advocated the household’s suitability as a focus of archaeological analysis (Wilk and Rathje 1982). In that study the household was defined in functional terms; more specifically, as a group which performs certain economic activities. The authors shared with contemporary anthropologists (e.g. Netting et al. (Eds.) 1984) the notion that the household’s composition arises from a predominant concern for efficiency in the arrangement of domestic activities. As an example, a large household is called for in situations where numerous personnel are required because a production process demands that many tasks be carried out at the same time (Wilk and Rathje 1982: 631f.). By following this line of reasoning, archaeologists can use an ancient society's mode of subsistence and economy to estimate the population size of its households.

However, the ‘household’ defined by Wilk and Rathje “does not necessarily live under the same roof” (ibid. 621), and, as a consequence, cannot automatically be equated with a co-residential group. The authors were forced to acknowledge this, in view of the fact that the economic activities which underpinned their definition of the household were not all residence-based, and participation in them did not entail co-residence. As Price and others have pointed out (Price 1999: 40; Allison 1999: 5), archaeologists who accept the disjunction between the co-residential group and the household are left with an intractable difficulty, for they cannot logically refer to the remains of discrete residences to distinguish one household from another. Archaeologists are therefore in the awkward position of being able to roughly reconstruct, on theoretical grounds, the morphology of a functionally-defined social group (the ‘household’ or its variations: the ‘domestic group’ or ‘residential corporate group’), but unable to associate any one group with a particular set of archaeological material.

In practice this paradox has not proved much of an obstacle to household archaeologists. The reason for this is that they tend not to treat the household as a collection of people at all, but as a conceptual reference point onto which they can map small-scale, localised activities such as craft-work, or food preparation and consumption, whose material remains they discover in association with domestic architectural remains (e.g. Allison (Ed.) 1999). The ôhouseholdô is also increasingly used as a theoretical vehicle for exploring the activities and socio-economic roles of categories of person which tend to be overlooked outside ôdomesticô contexts, such as non-elites and women (for a relevant literature review, see Hendon 1996). These approaches focus on the behaviour of particular categories of household member, at the expense of sidelining or ignoring the question of the groupôs overall configuration.

But even amongst archaeologists who equate the household with the co-residential group, reconstructing the groupôs membership is not always a priority (e.g. Blanton 1994). Generally speaking, the number of people occupying a residence has been of interest only as a means of estimating a settlementôs or regionôs population. Where this is the case, an average figure for co-residential group population size is calculated on the basis of samples of modern or historical co-residential groups; this is then multiplied by the number of residences identified in a given territory to yield an approximation for that areaôs total population (Kolb 1985: 582; de Roche 1983). There is often considerable variation in co-residential group population size and composition within the modern and historical samples on which this approach relies; yet this fact is of little concern to archaeologists intent on obtaining aggregate estimates.

Studies in which archaeologists *have* attempted to reconstruct aspects of the composition of ancient co-residential groups are relatively rare. Several of these are considered in Part III of this thesis.

Uses of the archaeological record

Part III combines a literature review and empirical investigation to evaluate the ways in which archaeologists infer demographic information from the archaeological remains of residences. It also assesses how useful the spatial attributes considered in Part II are for making inferences about the composition of co-residential groups.

One fact that emerges clearly is that the limitations and complexities common to the archaeological records of most ancient societies get in the way of making inferences. However, the interpretation of archaeological remains is also riddled with

misunderstandings about the relationship between the demographic characteristics of co-residential groups and attributes of their residences: misunderstandings, in other words, which the investigation in Part II can bring to light and which can thereby be avoided. All types of problem are discussed within the framework of the literature review, but their nature is best understood through situated examples.

Three archaeological contexts are chosen for this purpose. These consist of two famous Roman sites (Pompeii and Herculaneum), three Iron Age Israelite settlements, and nine Bronze Age Cypriot sites. Because their archaeological records are uneven in quality, the three contexts are well suited to gauging how differential preservation, sample size, and residence design affect our ability to recognise vital architectural clues (i.e. clues from which demographic inferences may be drawn). Moreover, written evidence about living arrangements is not equally available in the three contexts. The investigation takes advantage of this difference to explore how historical data can influence the interpretative process.

In short, Part III serves as a strategic testing ground for applying the insights developed from the ethnographic record to the interpretation of the archaeological record. This takes us a step beyond 'generalisation': it is not simply a matter of transferring insights from the ethnographic sample to other communities, but rather to a different type of evidence base altogether, one that deals with the past. Before setting out to do this, it is important to consider whether this type of transferral is valid.

This matter has received a lot of attention in literature concerning the uses of analogy in archaeology, most of which has argued that there is no way of avoiding analogical reasoning - the use of comparisons and juxtapositions between present and past cultural forms - in drawing inferences from the archaeological record (Wylie 1985; David and Kramer 2001: 43-54; Verhoeven 2005). These writings urge us to give due consideration to the relevance of the sources that we select for our analogies, and the risks that analogical inferences hold in misinterpreting the past.

With regard to sources for the interpretation of prehistoric material, recent practice is moving away from a reliance on cultures that are supposedly descended from those captured in the archaeological record (the 'direct historical approach'). By failing to appreciate the possibility of cultural discontinuities and the impact that the modern world-system may have had on the descendent cultures, the use of a single or small number of 'traditional' analogical sources can result in simplistic or indiscriminate projections from the present onto the past.

In this thesis, there is no attempt to infer living arrangements in Roman Naples, Iron Age Israel or Bronze Age Cyprus by appealing to cultures that may have descended from them, or to any other ethnographic source that shares ecological or technological similarities with those ancient contexts. Instead, the insights transferred to the archaeological record are derived from ethnology and findings from cross-cultural research. Using cross-cultural findings as a basis for analogical inference sidesteps the need to establish direct relevance between individual past and present settings, and avoids some of the criticisms normally directed at the use of single ethnographic cases as the source of analogies (Peregrine 1996). Crucially, using ethnology minimises the risk of narrow-mindedness or ethnocentrism in archaeological reconstructions, because inferences are based not just on one source, but on the rich and varied stock of analogs built up by ethnographers and ethnoarchaeologists over the years from various parts of the world.

Of course, if living arrangements occurred in ancient settings that are no longer in existence and were therefore not captured by the ethnographic sample, there is a danger that the analogical approach used here will fail to identify them. By relying on analogies with the present day and recent past, alternative scenarios that may have existed further in the past could be 'masked' (cf. Verhoeven 2005: 255). This a legitimate concern, and one that unfortunately cannot be circumvented: all interpretative models in archaeology are necessarily limited by modern concepts and contemporary understandings about the world. That said, it is still worthwhile using the ethnographic record to broaden out the range of possible interpretations available to archaeologists, at least enough to match the variety observable in the world today. To allow for the possibility of even further scenarios, analogical conclusions should be treated as tentative and subject to revision.

Whilst bearing in mind the risks mentioned above, Part III will proceed with the attempt to apply ethnographic insights to the past. As will soon become clear, the nature of the archaeological record makes it difficult to make much progress in this regard. The three case studies are primarily used to illustrate procedural sticking points and to suggest how some of them may be overcome, but a substantive interest is also shown in the Bronze Age Cypriot setting, whose residences have never before undergone intensive examination.

1.3 Outline of the thesis

The chapters that follow tackle the three nested objectives set out in section 1.1.1 . For convenience, the objectives are reiterated below:

1. To explain how co-residential groups in various cultural contexts form, and how they change their composition ï and especially what role space plays in this;
2. to determine whether basic demographic characteristics of co-residential groups can be inferred from the spatial attributes of their residences; and
3. to establish whether the insights developed from ethnographic research are useful for deducing co-residential group demographics from the archaeological record.

Part I consists of two chapters:

Chapter 2 establishes the concepts and terminology needed to describe the composition of co-residential groups. It selects three demographic concepts to use throughout the research ï size, structure, and residential pattern ï and describes how these can be measured.

Chapter 3 reviews the literature of anthropology and family history in an effort to meet the first of the objectives. It explores the various reasons that are known to cause variation in the membership of co-residential groups, but ends by suggesting that it may not be possible to integrate all of the influencing factors into a single theoretical framework. Instead, we can gain a better grasp on how and why co-residential groups vary in their composition by studying the residential decisions of inhabitants in particular settings, and identifying associations between co-residential group demographics and other variables across cultures.

Part II takes up these two propositions using the ethnographic record. It consists of three chapters:

Chapter 4 introduces the ethnographic sample, providing an overview of the nature, range, quantity and quality of the data used in Part II. It is supported by supplementary information in Appendices A-F.

Chapter 5 uses the ethnographic record to move us closer to meeting the first objective. Three communities from the sample serve as contexts for exploring residential decision-making. The close-up examination of these communities helps draw attention to the

importance of spatial circumstances in understanding residential decisions, and defines some of the ways in which space can impact on co-residential group composition.

Chapter 6 uses the entire ethnographic sample to fulfil the second of the objectives. The 368 residences and co-residential groups in the sample are used as a basis for exploring whether demographic information about co-residential groups can be derived from the spatial attributes of residences. The chapter is structured into four separate studies, each investigating how a particular spatial attribute relates to the population size and structure of co-residential groups, or to a community's residential pattern. The chapter ends by drawing together the main findings and conclusions from the investigation.

Part III turns from present-day to ancient housing, and concentrates on the third of the objectives. It consists of two chapters:

Chapter 7 presents and critiques approaches used by archaeologists to infer the demographic characteristics of the occupants of ancient residences. The discussion revolves around two case studies, one on the residences of Roman Pompeii and Herculaneum (Wallace-Hadrill 1994) and the other on Iron Age Israelite residences (Schloen 2001). An assessment is made of the method used to deduce demographic information about their inhabitants, and fresh interpretations are offered in light of the discussion and findings from Chapter 6.

Chapter 8 focuses in greater depth on a single archaeological context, Cyprus during the Bronze Age (c.2300 BC to c.1050 BC), to explore whether the demographic characteristics of co-residential groups can be inferred from the plans of archaeologically excavated residences. The chapter presents the procedural difficulties that surround the inference of co-residential group composition from archaeological data, and argues that multi-conjugal occupancy can be tentatively reconstructed from the available evidence at the site of Marki-*Alonia*. It also points to the interpretative potential offered by sites where high standards of excavation and publication have been used.

Chapter 9 brings the thesis to a conclusion with a summary of its objectives and how they were met, and a brief reflection on its limitations and potential future directions.

Part I:

The Literature of Anthropology and Family History

CHAPTER 2
Describing the composition of co-residential groups

2.1 Introduction

The term co-residential group was introduced in Chapter 1, and will be used throughout this thesis to refer to any group of people who share the same residence. As previously explained, by substituting ôhouseholdô with a term that is free of economic connotations we create room to explore all possible explanations ï economic or otherwise ï for variation in living arrangements. There is, however, a more straightforward and compelling reason to refer to a group of people who create physical boundaries to separate themselves from others by a label of their own. Such collectivities recognise themselves and are recognised by others as distinct groups, solely by virtue of the walls and physical boundaries that separate them; they have an undeniable emic and etic reality that deserves to be acknowledged (c.f. Verdon 1998: 35).

For practical purposes, limits need to be placed on this definition. People use and share all sorts of buildings and structures, but not all buildings and structures are of interest here, just residences. Residences will be defined more precisely in Chapter 4, but in principle the single most important characteristic of residences is that they provide space for sleeping. A variety of institutions and commercial establishments (such as barracks, hospitals, hotels and boarding houses) may also offer lodgings, but their ôinhabitantsô are better understood as specialised or ephemeral collectivities and will not be considered as co-residential groups for our purposes. What we are left with, for the most part, are familial groups ï that is to say, groups whose members share affinal, consanguineous or fictive kinship bonds ï and, to a lesser extent, expedient groups of friends or non-relatives.

In short, the typical co-residential group is the familial group. Saying so is a handy way of familiarising the reader with the concept; it is not to say that co-residential groups are analytically equivalent to ôfamiliesô, an equation that has already received much well-deserved criticism (Yangisako 1979; Wilk and Netting (Eds.) 1984) and is avoided in this thesis.

This chapter is concerned with defining ôco-residential group compositionô, so that the concept and its associated terminology are fit for purpose, ready to be used in the chapters that follow. Section 2.2 establishes a vocabulary with which to talk about the composition of co-residential groups, drawing on relevant concepts from anthropology, family history and demography. Section 2.3 summarises the three demographic concepts selected for use in this

project: size, structure, and residential pattern. Finally, section 2.4 describes how these concepts can be measured, so that the composition of groups can be described and compared.

2.2 The demographic characteristics of co-residential groups

To make any discussion of co-residential groups possible first requires that we establish some sort of shorthand or terminology for describing their composition. Specifically, what is needed is a way of capturing and communicating information about the demographic make-up of groups which:

a) is suited to cross-cultural research;

b) takes into account the spatial concerns of this particular project;

c) takes into account any peculiarities and limitations in the ethnographic data used in Part II (which was originally collected with other research aims in mind);

d) but can also be reconciled with more established descriptive frameworks, so that reference may be made to studies which utilise them.

Ideographs of the type employed by social anthropologists and introduced to the field of family history by Hammel and Laslett (1974) arguably constitute the best way of conveying a comprehensive, yet succinct, description of co-residential group composition. A single ideograph represents every residentôs kinship relationship to each of his or her co-residents using a combination of symbols and connecting lines. Despite their clarity, however, ideographs are too unwieldy to be used in written discussions. Moreover, the amount of information they contain can itself be a drawback, for whilst attention to detail renders ideographs particularly apt for conveying the make-up of *individual* co-residential groups, those same details can make comparison between groups unmanageable.

Rather than outlining the complete configuration of groups (pictorially or otherwise), what this project requires in order to facilitate comparison is a set of terms, each summarising one key aspect of composition that is subject to variation. The following subsections explain what those key aspects are, justifies their selection, and thus establishes the three demographic variables that are used in the remainder of the thesis. Along the way, it also establishes the vocabulary used throughout this research.

2.2.1 Basic composition

In searching for an appropriate terminology, the first port of call should be the subfield of ófamily and household demographyô which regularly deals with the measurement of co-

residential group demographics. It is worth noting that this is still considered by many to be a relatively underdeveloped branch of demography (Murphy 1991: 175; Bongaarts 2001: 263), despite the recognition of progress in methods and models over the past three decades (Bongaarts et al. [Eds.] 1987; van Imhoff et al. [Eds.] 1995; special issue in *Demography* 32(3), 1995). Nevertheless, it is instructive to scan the available literature for the type of characteristics family demographers consider worthwhile analysing.

Papers by two of the most eminent scholars on the subject, Thomas K. Burch and John Bongaarts, can serve as reference points. Burchôs paper is an early overview of the subfield (1979) while Bongaartsôis a more recent report on a cross-cultural investigation (2001).

The first demographic characteristic of óhouseholdsô (i.e. co-residential groups) to be brought up in both cases is also the most obvious and basic one: group ósizeô, which represents the groupôs population and is measured by a straightforward count of residents. Each author then goes on to discuss group óstructureô, which

> centers around the notion of departures from what is presumed to be the simplest, or rudimentary form, the nuclear group of an adult couple and their children. More complex structures are seen as the result of additions of other kin (parents of the couple, grandchildren, uncles, etc., i.e., any non-nuclear kin) or the addition of unrelated persons such as servantsé boarders, lodgers or roomers (Burch 1979: 175).

Bongaarts and Burch mention a large and somewhat bewildering array of measures of structure[4]. Rather than reproducing them, the challenge here is to find a small selection which suits the focus of this project but still manages to indicate, in a consistent and reliable manner, how far the membership of any one group deviates from the benchmark of óan adult couple and their childrenô.

As this project has a particular interest in the relationship between the demographic characteristics of co-residential groups and the design of their residences, it would seem reasonable to focus on dimensions of group structure which are likely to have some bearing on architecture. Certain aspects of group structure almost certainly *do not* find spatial expression in the layout of residences. One example of this concerns a measure of structure

[4] Bongaartsô measures include: number of adults and children per group; number of adult members, categorised by their relationship to a designated reference person called óthe headô; number of child members, categorised by their relationship to the head; and a classification of the group according to the relationship of non-nuclear members, if any, to the nuclear component within the group (Bongaarts 2001: 267-9). Burch mentions the existence of various alternative group classifications (Burch 1979:175), and an additional measure, the number of marital units in the group (married male members, plus widowed or divorced males and females). Note that measures are often calculated from aggregate data (e.g. adults per household is determined by dividing the total adult population by the total number of households in a sample).

referred to by Bongaarts and Burch: the number of adult members in a group. Though this may be informative about the group (when set against the number of non-adult members, for instance, it can serve as a rough proxy of the ratio of producers to non-producers or income holders to dependants), it is unlikely to make an impression on domestic architecture, given that, in modern British society at least, there is considerable overlap in the spaces used by adults and children. As with age composition, gender composition (measured by counts of male and female members) is an aspect of co-residential group structure which perhaps should not be expected to have a discernible impact on architectural layouts outside of societies which practise *purdah*.

There are other perspectives on co-residential group structure, however, which are better suited for our purposes. In order to recognise whether a groupôs composition matches or deviates from the benchmark of óan adult couple and their childrenô, it is often sufficient to know one or two basic facts: whether non-relatives are present in the group, and how many conjugal couples occur within its membership. Either or both facts could be employed as effective, if somewhat rudimentary, indicators of the concept of co-residential group structure. Anyone enculturated in a Western European tradition would immediately recognise the likely spatial implications of these deviations from the benchmark, since unrelated persons tend to require separate sleeping accommodation or even independent quarters within the residence; likewise, when more than one conjugal couple shares a residence, each couple requires a separate sleeping room in order to preserve its privacy. These are admittedly ethnocentric premises, but from them we may hypothesise that the spatial design of residences will reflect whether its occupants include persons who are not related to the co-residential group head (i.e. the resident under whose name the property is held), and whether they include multiple conjugal couples.

For the purposes of this research, a co-residential groupôs structure may therefore be defined by a) the presence or absence of non-relatives of the head, and, b) the number of conjugal couples in its membership. Of course, as with any of the measures mentioned by Burch (1979) and Bongaarts (2001), these represent only partial perspectives on group structure. The advantage of these two particular indicators is that ï if the premises above are correct ï they have a greater likelihood than any others of finding expression in the design of residences. This is likely to prove useful with regard to the projectôs second aim, that of determining whether the spatial attributes of a residence can point to the demographic make-up of its occupants.

It should be noted at this stage that while these indicators depart from the normal repertoire used in family and household demography, they are well known and play a prominent role in family historiansô classification of co-residential group composition.

The scheme used most frequently during the 1970s and 1980s to classify óhouseholdsô in quantitative family history research is the Hammel-Laslett typology (Hammel and Laslett 1974). To implement this typology, co-residential groups must be arranged along two axes of compositional variation (ibid. Table 1), each of which reflects a roughly similar measure to one of the two mentioned above. Hence, groups are initially categorised by the number of óconjugal family unitsô (CFUs) they contain.[5] This is not an exact equivalent of the number of conjugal couples, as a CFU can consist of a lone parent with one or more unmarried children as an alternative to a pair of conjugal partners (with or without unmarried children), but the broad idea behind the enumeration of either conjugal couples or CFUs is the same: to gauge by how many ónuclearô elements the composition falls below or above the typical benchmark of óan adult couple and their childrenô. Groups that have been categorised in this way are then subjected to further classification by focusing on another dimension of their composition: the presence or absence in their membership of various categories of person who are unrelated to the head, such as servants, visitors, boarders or lodgers.

Thus, the two indicators of co-residential group structure proposed here as the most likely to vary in relation to residence design ï and therefore most relevant to the projectôs aims ï also have some pedigree within family history. In theory, they would seem to be good choices for use in the present research.

That being said, a quick look at the sample of co-residential groups used in Part II (see Appendix E) reveals that there are in fact very few groups containing any non-relatives. This suggests that one of the indicators will be less useful for our purposes than the other. In addition, in view of the occurrence of groups in the sample containing polygamous men with multiple co-resident wives, it is necessary to make a slight adjustment to the second indicator. Since each wife in such a living arrangement would presumably want to maintain her own and her husbandôs privacy from every other co-wife and from any further conjugal couples in the group by using a separate sleeping room, it is in fact the number of conjugal unions in existence amongst a set of occupants, rather than the number of conjugal couples in the group *per se*, which hypothetically has a bearing on the layout of a residence. Consequently,

[5] Of the six main categories in the Hammel-Laslett typology, the first two include no CFUs (ósolitariesô and óno familyô), the next two consists of a single CFU (ósimple familyô and óextended familyô), and the fifth consists of multiple CFUs (ómultiple familyô). The sixth category is for co-residential groups of indeterminate composition. Note that subcategories within the ósimple familyô category distinguish between CFUs which contain conjugal partners and those which do not.

identifying how many conjugal unions exist amongst a groupôs members constitutes the most appropriate way of measuring the concept of co-residential group structure in this thesis.

Summary

Family and household demographers tend to analyse two demographic characteristics of co-residential groups: population **size** and **structure**. The discussion so far has given some consideration to the question of how structure ought to be measured in view of the particular concerns of this project and peculiarities in the corpus of data. A full operational definition for the concept of structure, as well as for population size, is presented in section 2.4.

In the meantime, we have equipped ourselves with enough information to begin to build a vocabulary with which to talk about groups and compare their composition. Some of the terms employed throughout the remainder of the research are set out below:

- Co-residential groups may be described as óno-conjugalô, óone-conjugalô, ótwo-conjugalô, etc., depending on the number of conjugal bonds in their structure.
- By conceptualising no-conjugal and multi-conjugal groups as being on either end of a scale of óstructural complexityô, the number of conjugal bonds can be used to distinguish groups that are ósimplerô or ómore complexô than others.
- Based on the notion of structural complexity, groups can also be divided into two broad camps: those containing one or no conjugal bonds (which may be thought of as perfect or imperfect versions of the typical benchmark, consisting of óan adult couple and their childrenô) are described by the adjective ósimpleô, while those containing more than one conjugal bond are labelled as ócomplexô.
- The term óextendedô, on the other hand, which has long been in use amongst anthropologists (e.g. Pasternak et al. 1976), family historians (e.g. Kertzer 1991: 159), sociologists (e.g. Litwak 1960) and other scholars (e.g. Flannery 2002) to refer to groups whose compositions deviate in various ways from the typical nuclear family, or to indicate wider kinship networks, is deemed imprecise and therefore avoided here.

2.2.2 Composition: the broader view

Anthropologists, family historians, and family and household demographers rarely study or describe individual co-residential groups. More often they conduct cross-sectional research, which involves the analysis of a set of co-residential groups in existence at a single moment in a particular community.[6]

[6] The term ócommunityô is used here to refer to the population at a particular locale (such as a settlement).

As is usual with this type of research design, any variation observed across the population is potentially of interest, and is conveyed using descriptive statistics. Frequency tables are the most common method of summarising all the different configurations of residents in a community. What is worth calling attention to is the way that intra-community variation in the composition of co-residential groups tends to be explained: similarities in composition are seen as the manifestation of regularities in the behaviours of residents at specific times during their individual life-courses.

The reasons why the inhabitants of a community are prone to making similar residential decisions over their life-course will be considered in Chapter 3 (see section 3.3). The aim here is to argue that the existence of community-wide behavioural tendencies is so widely acknowledged in the literature of anthropology and family history as to warrant the use of a third demographic variable in this research. While the first two variables, population size and structure, refer to demographic attributes of individual co-residential groups, this third variable may be thought of as a demographic characteristic of communities.

In the literature, community-scale trends in the behaviours of residents are expressed through a trio of related concepts. óPost-marital residence rulesô, ódevelopmental cyclesô, and ólimits of growthô relate to residential decisions made by people at different stages of their lives: as newlyweds, as parents who are close to retirement or death, and as single persons before or approaching their marriage.

In what follows, these three concepts are considered in turn. The principal point to note is that residential decisions associated with particular life-stages are regarded in the literature as being broadly standardised within individual communities. Because of this, the óruleô, ócycleô or ólimitô which encapsulates them is often treated as a distinct feature of the community. As órulesô, ócyclesô and ólimitsô can vary from case to case, they have been deployed in cross-cultural anthropological and historical studies as demographic variables, urging us to create some sort of equivalent variable to serve in the present research. The 'residential pattern', which combines aspects of all three concepts, will be put forward as this variable.

Post-marital residence rules

Around the start of the 20th century, anthropologists began to note the existence of a tendency for either the men, or the women, or both sexes in a society to change residence after marriage. The terms ómatrilocalô and ópatrilocalô were first used by Thomas (1906) to describe communities in which husbands, in the former case, or wives in the latter, appeared to have a proclivity for moving in with or near their in-laws after their wedding or betrothal.

These tendencies, along with their variations (such as bilocality) and alternatives (e.g. avunculocality), collectively came to be known as post-marital residence rules.

In the following decades it became standard practice to categorise every co-residential group in a community according to whether its composition could plausibly have arisen through one or another of the rules (e.g. Goodenough 1956), and to ascribe to the community the single rule which seemed to account for the most common configuration of residents. Thus, from a distribution of various living arrangements, the norm or prevalent behaviour amongst the inhabitants of a community was derived and used to classify that community.

This practice fell out of fashion as the concept of developmental cycles became more established (see below). In part, this was due to the recognition that the relative frequencies of different living arrangements was a somewhat arbitrary criterion for classifying societies (cf. Hammel 1984: 32ff., Verdon 1998: 26), especially in cases where the predominant arrangement was outnumbered by all of its alternatives combined (Verdon 1980: 116). A further reason for its abandonment was that the rules themselves were defined in ambiguous ways which undermined inter-observer consistency. The term matrilocality, for instance, was interpreted by some researchers to signify a tendency to move into the residence of relatives or in-laws and become part of a pre-existing co-residential group, and by other researchers to mean the tendency to settle into a separate residence located near to that of relatives or in-laws (Casselberry and Valavanes 1976).

Nevertheless, due to a simplicity which lends itself easily to cross-cultural analysis (Verdon 1980: 111), terms referring to residence rules are occasionally still used to describe and compare communities. Where the terms appear nowadays, as in *The Encyclopaedia of World Cultures* (1994), they do not denote the outcome of any systematic analysis of the distribution of living arrangements. Instead, the terms are used in ways that recall their original function: to indicate an ethnographerôs perception of the residential decision most popularly practised by the newlyweds in a community.

Developmental cycles

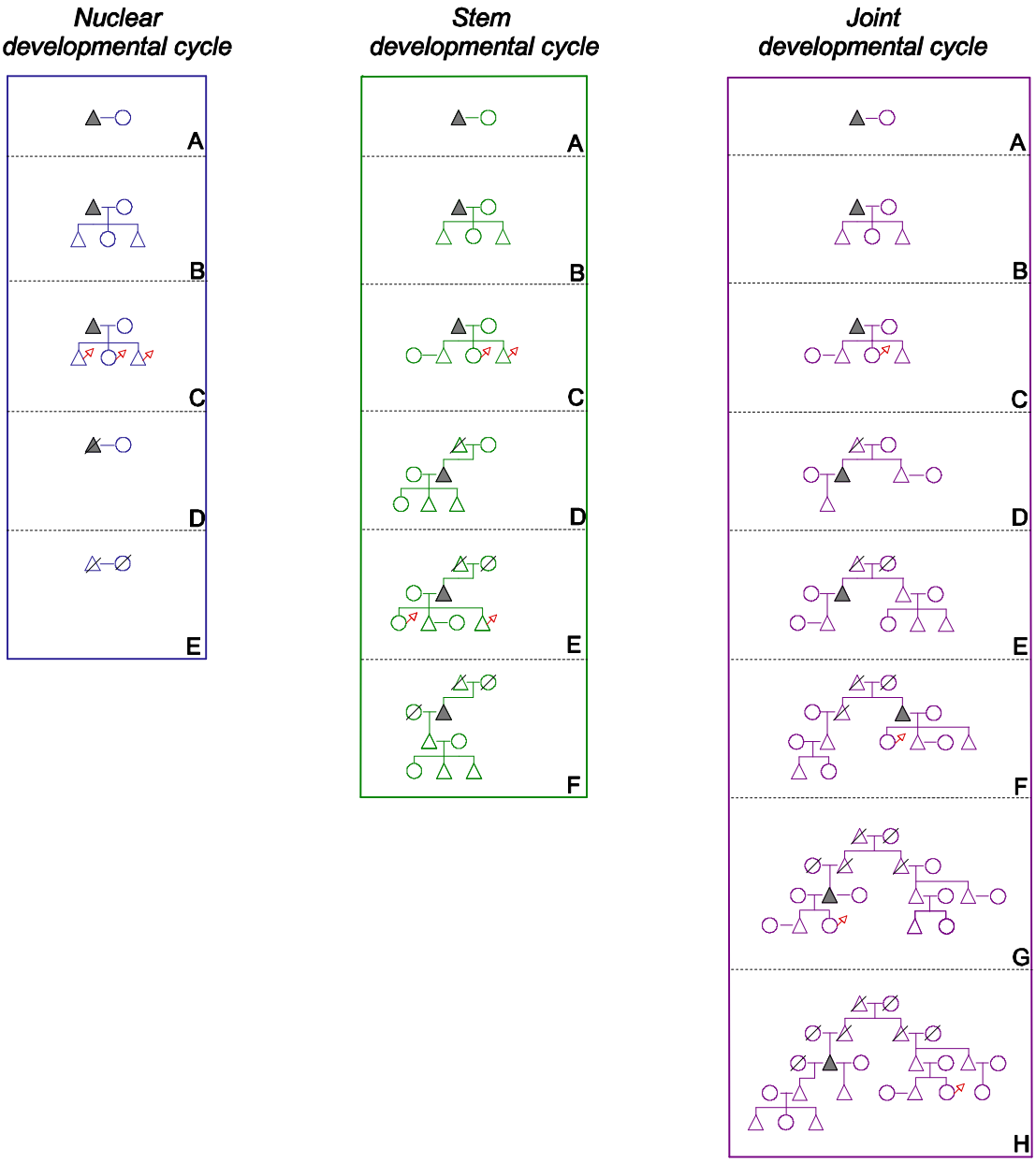
In the 1950s, a theoretical concept arose in anthropology which was capable of accounting not only for the most common configuration of residents in a community ï which post-marital residence rules could already do ï but also for alternative living arrangements. Although it was directly concerned with the ñhouseholding and housekeeping unitò known as the ódomestic groupô (Fortes 1971 (originally 1958): 8), the concept is also applicable to the co-residential group, by virtue of the fact that their memberships more often than not coincide.

The developmental cycle, as it was called, summarised the three basic steps that all co-residential groups go through if they are to survive in the long term: a phase in which their membership grows, as married members produce offspring (expansion); a subsequent phase in which at least some of those adult offspring depart from the group, thus altering its composition (dispersion); and a phase in which any adult offspring that have remained in the group assume the roles of their parents after their retirement or death (replacement), bringing a spouse to the group in preparation for starting a new phase of expansion (Fortes 1971 (originally 1958): 4f.). Variation in the demographic composition of co-residential groups at any one moment in any given community could therefore be explained in part as the result of some groups being in the dispersion phase of this process whilst others are in the expansion or replacement phases (ibid. 3).

The concept of the developmental cycle was first expounded and illustrated by example in an edited volume of ethnographic studies (Goody (Ed.) 1958), and has since proved useful to both anthropologists and family historians in making sense of the bewildering diversity of living arrangements within some communities (e.g. Berreman 1975, dôArgemir 1988). Perhaps its greatest utility, however, has been to draw attention to the existence of alternative replacement strategies in different societies. Viewed from a cross-cultural perspective, the developmental process can be seen to follow three alternative routes after the dispersion phase: one which leads to the extinction of individual co-residential groups due to the lack of a replacement phase; another in which married couples are replaced by only one of their offspring; and a third in which they are replaced by two or more of their offspring. These alternatives are referred to here, in accordance with the standard nomenclature employed in family history (cf. Kertzer 1991: 158f., Lee and Gjerde 1986), as the ónuclearô, óstemô and ójointô developmental cycles respectively. The stages of the three cycles are illustrated in Figure 2.1 (adapted from Lee and Gjerde 1986: Figures 1-3).[7]

The existence of discrete types of developmental cycle offers a means of categorising individual communities without reference to post-marital residence rules: the deciding criterion is not the most common residential decision made by newlyweds, but the most

[7] Generally, in contexts where the stem developmental cycle operates the offspring who replaces his or her parents is designated either by gender, or by birth order, or by both attributes. In the *Stem* illustration in Figure 2.1, replacement involves the married coupleôs eldest son, but alternative cases might instead involve a daughter, or the eldest offspring (regardless of gender), or the youngest offspring (regardless of gender). Furthermore, in contexts where the joint developmental cycle operates, a married couple may be replaced either by all of their sons (as shown in the *Joint* illustration in Figure 2.1), or, alternatively, by all of their daughters. Note also that, whilst the co-residence of multiple spouses of the same individual can be a feature of the joint developmental cycle (as shown in Figure 2.1), polygamy does not occur in all societies where the joint cycle operates.



△ male
○ female
△–○ conjugal couple
△ ○ individual due to depart from the co-residential group
△ ∅ deceased male or female individual
▲ co-residential group head
△ ○ siblings (in birth order, from left to right)
△ ○ male or female offspring

FIGURE 2.1 Stages in the nuclear, stem and joint developmental cycles

common *replacement strategy* employed by parents in the population, and the demographic trajectory that this entails. In order to identify which cycle operates in a community, researchers may either collate information from the life histories of its older inhabitants, or they may build a ósynthetic cohortô from cross-sectional census data. The latter involves separating out the groups in a community headed by recently-married persons, those headed by middle-aged persons, and those headed by elderly persons, and making the assumption that the memberships of the former will gradually transform to resemble the two latter as their heads advance in age.

The best known application of this procedure was by Berkner (1972), who demonstrated that the stem developmental cycle operated in the Austrian manor of Heidenreichstein in 1763, despite the statistical predominance of co-residential groups consisting of just one adult couple (with or without children) recorded in that yearôs census. The infrequency of two-conjugal groups was explained as the result of the relatively short duration of the stage in the cycle in which couples were alive at the same time as a married son and his wife (stage C in the *Stem* illustration in Figure 2.1). Elsewhere, applications of this method have convincingly established the operation of nuclear or joint developmental cycles (e.g. Arcury 1984, Wolf 1984).

Yet the idea of the developmental cycle has not been without its critics. Objections mostly arise when the developmental cycle is viewed as a means of predicting the future residential decisions of the inhabitants of a community, or as providing an accurate model of consecutive states in co-residential group composition.

Arguments are often directed at the use of synthetic cohorts. This method presupposes that co-residential group heads will make the same residential decisions as their predecessors at each stage of their life-course, while ignoring the possibility that social and material conditions might change over time, encouraging later generations to make different choices from earlier ones (cf. Yanagisako 1979: 169, Janssens 1993: 51).

Moreover, it has been argued that there are communities to which it is impossible to ascribe any particular developmental cycle because their co-residential groups do not follow a single developmental trajectory. This is backed up by longitudinal studies which trace the composition of co-residential groups from one census to another (e.g. Otterbein 1970; Freed and Freed 1983), or which track changes in the membership of individual groups over a number of years from on-going entries in population registers (e.g. Janssens 1993). Longitudinal research has shown that not every group in a community experiences the same order and number of additions and losses amongst its members, and that unpredictable

fluctuations in composition can occur because people sometimes temporarily rejoin a group after withdrawing their membership from it.

While it is true that the three versions of the developmental cycle cannot be relied upon to accurately model how the composition of individual groups changes over time or to forecast future changes in membership, the distinction the cycles draw between alternative replacement strategies (involving none, one, or several of a couple's children) remains useful. Each replacement strategy affects matters of frequency and duration in ways that are discernibly distinct from its two alternatives. The three strategies affect how regularly new groups form in a community, how long groups can maintain a complex structure, and how quickly and thoroughly membership attrition impacts on group composition. Such effects are observable at the scale of the community: they can be seen in the distribution of different living arrangements at a single moment in time, and are distinct enough to have served as criteria for categorising communities in cross-cultural research, most famously in Hajnal's classification of pre-industrial 'household formation systems' (Hajnal 1982), and Laslett's typology of European 'sets of tendencies' (Laslett 1984: Table 14.1; cf. Wall et al. (Eds) 1983: Table 17.5).

Since the 1980s, anthropologists and historians concerned with analysing co-residential group composition within and across societies have routinely referred to communities as having a nuclear, stem or joint 'household system' or 'cultural ideal' (e.g. Netting et al. (Eds.) 1984; Kertzer 1991; see also various papers from *The Journal of Family History*), alluding to the operation of one or another of the developmental cycles and illustrating just how pervasive this concept has become.

Limits of growth

In the late 1970s, a different approach to classifying a community's living arrangements was proposed (Verdon 1979). This was based on Verdon's thesis that co-residential groups belonging to the same community are incapable of developing beyond a certain level of structural complexity. Since structural complexity in any group is circumscribed by the departure of members (as well as their deaths), this suggestion carries with it the implication of community-wide regularities in the timing of departures, as well as in the categories of resident which depart.

Verdon coined the term 'limit of growth' to refer to the highest level of structural complexity typically achievable by the co-residential groups of a community. This limit, he claimed, is surpassed only by groups characterised by "uncommon and singular demographic, economic, or physical circumstances" (Verdon 1979: 91). Thus, to discover a community's limit of

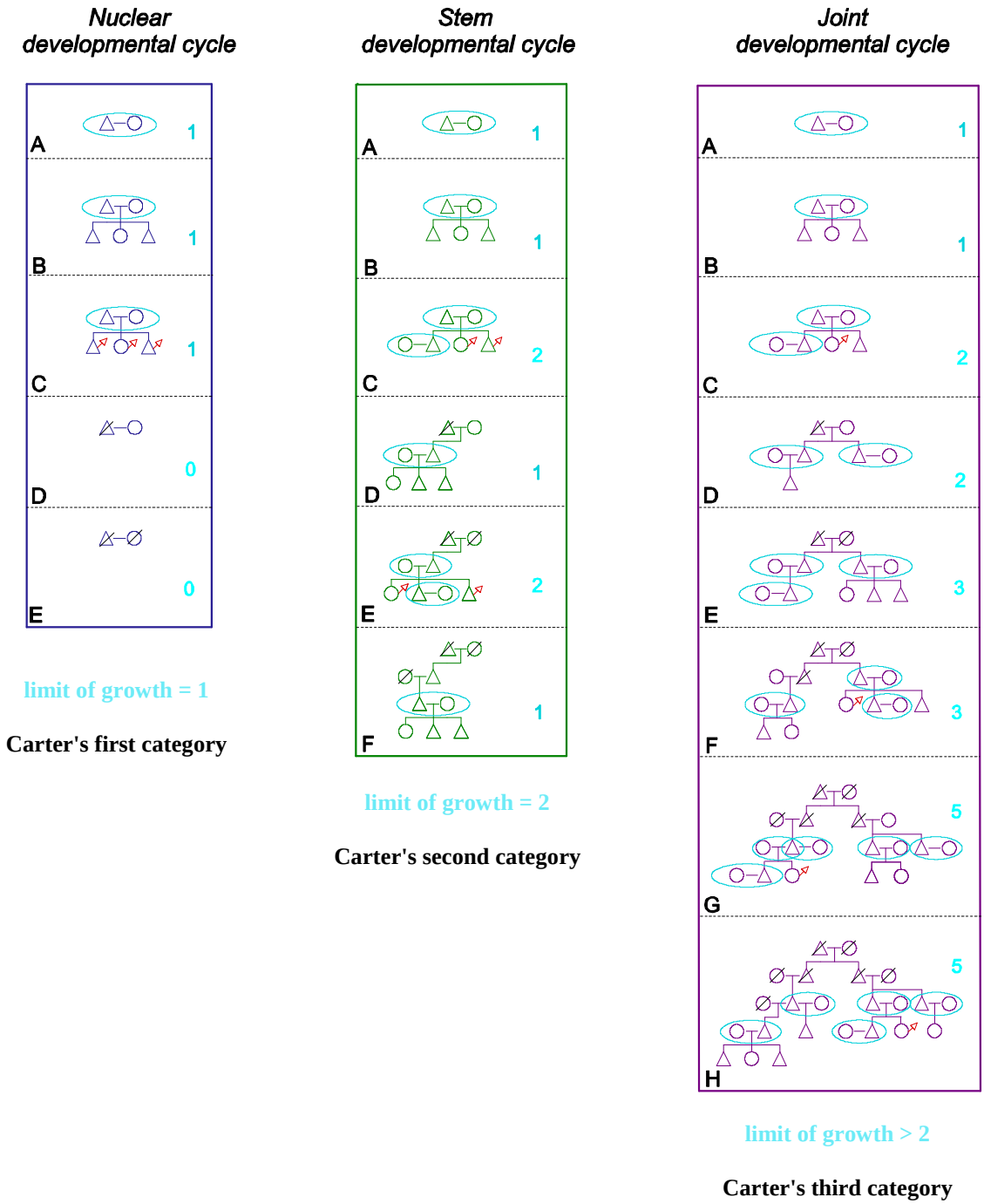
growth from census data, one must first factor out any configurations of residents which other inhabitants in the community consider ñabnormalò (Verdon 1998: 42), and then identify the most structurally complex groups still remaining.

Although Verdon expounded his thesis in several publications and applied his ideas to both his ethnographic and historical research (Verdon 1979; 1980; 1998), the notion of the limit of growth had little influence in anthropological or historical scholarship of the 1980s. This was possibly owing to waning interest around that time in the subject of co-residential group composition, rather than inadequacies in the notion itself. Crucially, however, he was not alone in pointing out the apparent consistency with which the co-residential groups in a community restrict their memberships so that they do not exceed a certain discernible level of structural complexity. Carter, for example, noted this, and also the existence of cross-cultural differences ñin terms of restriction on compositionò (Carter 1984: 54). He conceptualised societies as falling into three categories, each characterised by a different degree of avoidance between couples in their living arrangements:

> At one extreme is what Gudeman calls ñthe co-residential couples prohibitionò. Among Panamanian countrymen Gudeman reports, and this appears to be widespread in Euro-American cultures: "No two couples may occupy the same bedroom or even the same house [é] (1976:118)". A somewhat weaker restriction is found in Japan and in other areas where so-called stem families are reported. In Japan two or more couples may coreside in a single household but only if each couple contains a person who is or was married to the household head, the retired head, or the heiré At the opposite extreme, in Indiaé Chinaé Yugoslaviaé and much of sub-Saharan Africaé there are no limits on the number of coresidential couples. (Carter 1984: 54) [all references to literature about these countries are omitted here].

Carterôs ideas about restrictions on composition imply ï as does Verdonôs thesis ï that residentsô departures from their co-residential groups are governed by regularities which extend throughout entire communities. Moreover, it is possible to infer the life-stage of those responsible for the regularities: since the regularities set a limit on the number of conjugal couples which co-exist as members of the group, single residents must be terminating their memberships prior to marriage, denying groups the chance to accrue any further conjugal bonds and so achieve greater structural complexity.

Both Verdon and Carter treated the highest level of complexity typically achievable by the co-residential groups of a community as a significant attribute of that community, and categorised different societies upon this basis. Though this method of classification was never widely adopted for use in cross-cultural research, it has much in common with more popular classifications which rely on developmental cycles (see above).



△ male
○ female
△–○ conjugal couple
△⚦○⚦ individual due to depart from the co-residential group
△ ∅ deceased male or female individual
1 number of conjugal unions amongst the residences
△ ○ siblings (in birth order, from left to right)
△ ○ male or female offspring

FIGURE 2.2 The developmental cycle, Carter's three categories (1984), and Verdon's limits of growth (1979)

Figure 2.2 illustrates how Carterôs three categories of restriction relate to limits of growth, and how these in turn relate to developmental cycles. In societies of the first category (illustrated in the left box), where all couples avoid co-residing, one-conjugal groups represent the limit of growth. In societies belonging to Carterôs second category (central box), the only married persons to co-reside are the head and a single chosen heir together with their respective spouses; thus, two-conjugal groups represent the limit of growth. In societies of the third category (right box), other married persons may also co-reside, so the limit of growth is represented by groups of higher complexity than in the previous category, although the precise upper limit in terms of the number of conjugal bonds is not pre-defined. These three different limits of growth at the same time represent the most complex configurations of residents which can emerge under the operation of the nuclear developmental cycle, the stem developmental cycle, and the joint developmental cycle, respectively.

Residential patterns

It is clear from the above that it is established practice in both anthropology and family history to pay special attention to community-scale trends in how people behave when deciding upon their living arrangements. Such trends, whether labelled as post-marital residence rules, developmental cycles, or limits of growth, have proved popular as demographic variables in cross-cultural research. On this basis, it would seem appropriate that a similar variable should be included in this project.

It was felt that a new term ï the óresidential patternôï should be introduced for this purpose. The residential pattern denotes the outcome of the operation of the developmental cycle, in terms of who retains membership of their natal co-residential group (the group they were born into) after getting married. In communities characterised by a nuclear developmental cycle, no one remains a member of their natal co-residential group after marriage. In communities where a stem developmental cycle operates only one member per group per generation maintains his or her membership for life and upon marriage may bring a spouse into his or her natal co-residential group. By contrast, wherever the joint developmental cycle operates there are several people, all of the same sex, in every group who retain membership for their entire lives and may bring their spouses into their natal co-residential group. These differences may be appreciated by comparing Stage C of the three cycles in Figure 2.2.

The residential pattern in a community can be described as either ónuclearô, óstemô or ójointô, depending on which of these outcomes is in evidence. The three alternative outcomes should not, however, be thought of purely as the result of parentsô different replacement strategies. Residential decisions associated with different life-stages are inter-related: the choices parents make concerning the children who will replace them in their co-residential group

directly affect, and are affected by, the residential decisions of newlyweds and of unmarried members of the group. For example, in a community where parents usually designate none of their children to replace them (i.e. the developmental cycle is nuclear), children may feel compelled to terminate their membership in their natal co-residential groups before getting married (i.e. one-conjugal co-residential groups represent the limit of growth), and newlyweds, who would not be welcomed for long in either the groomôs or brideôs natal groups, may feel forced to reside independently (i.e. neolocality is the post-marital residence rule). The result of this particular combination of trends is that no one in the community continues to live as part of their natal co-residential group after marriage, and, consequently, the community is characterised by the ónuclear residential patternô.

A residential pattern therefore reflects not only the operation of a specific developmental cycle, but also the existence of a particular post-marital residence rule and limit of growth in a community. Hence, the concept of the residential pattern, if measurable, would function well as a demographic variable, providing a well-rounded representation of community-wide regularities in the behaviours of residents.

Summary

This subsection has defined the **residential pattern** as a demographic characteristic of communities, and put this forward as one of the three demographic variables to be used in the analytical chapters of this thesis. Like residence rules and the developmental cycle ï which are more established in anthropological and historical cross-cultural research ï the residential pattern summarises community-scale trends in residential decisions, singling out the categories of resident who typically have licence to stay in their natal co-residential groups after marriage. A full operational definition of the concept of the residential pattern is offered in section 2.4.

2.3 An overview of composition: size, structure, residential pattern

Section 2.2 of this chapter set out to describe co-residential group composition in a way which was comparable to existing descriptive schemes, but at the same time was suited to the particular aims of this project, to its theoretical and practical scope, and to the data available for analysis in Part II. Three demographic characteristics were ultimately selected to function as variables in the cross-cultural research proposed in Chapter 1: size, structure, and residential pattern. Notably, the two former concepts relate to co-residential group-level data, and the last to community-level data.

In arriving at this selection a major consideration was the need to represent co-residential group demographics in a substantive way, whilst avoiding reliance on an overly long and

cumbersome list of traits. The balance between quantity and substance is a difficult one to strike, yet the three chosen characteristics could be said to achieve it. Though few, the characteristics serve the needs of this project in several important respects.

Most importantly, in combination they manage to convey a groupôs overall dimensions: its scale, its basic shape or configuration, as well as an idea of the scale and shape the group could potentially achieve (based on trends in residential decisions within the wider community). Moreover, they are similar enough to the demographic attributes studied by anthropologists and family historians to make the present research and anthropological and historical research mutually intelligible. By establishing a common frame of discourse it becomes possible to discuss and evaluate studies conducted in these fields. At the same time, the simplicity and discreteness of the characteristics makes them well suited to function as independent or dependent variables in the quantitative analysis planned for Chapter 6, in which co-residential group composition is examined against the spatial attributes of residences.

2.4 Operational definitions: size, structure, residential pattern

In order to describe any given co-residential group by its three demographic characteristics, it is necessary to specify precisely how these can be measured. Thus, to end this chapter, an operational definition is offered for the concepts of size, structure, and residential pattern.

Size

The concept of size relates to the co-residential groupôs total population. It can be measured directly by counting every person who regularly sleeps in a given residence overnight, and anyone who has regular access on a seasonal or periodic basis to sleeping accommodation in that residence. For analytical purposes, size can be described as an interval variable which takes integer values.

Structure

The concept of structure represents how far the membership of the co-residential group deviates from the benchmark of óan adult couple and their childrenô. Although this may be measured in a variety of ways, the indicator proposed here is a count of the conjugal bonds which exist amongst the groupôs members. This indicator suits the spatial interests of this project (since it is hypothesised that discrete conjugal bonds find expression in the spatial layout of residences), whilst remaining broadly comparable to that normally used by family historians (i.e. a count of CFUs).

Structure can be treated as an interval variable based on a count of conjugal bonds. Alternatively, it can be treated as an ordinal variable, whose categories ï óno-conjugalô, óone-conjugalô, ótwo-conjugalô, etc. ï may be ordered by rank, or grouped into two classes: simple and complex.

Residential pattern

The residential pattern combines and distils three existing concepts in anthropology and family history, all of which have to do with the occurrence of regularities in the residential decisions of people belonging to the same community. It is specifically concerned with one facet of these regularities: the maintenance by some people but not others of life-long membership in their natal co-residential groups.

The residential pattern is a theoretical construct more abstract and multidimensional than either size or structure; hence the most direct and reliable way of tapping into this concept is through qualitative research. This would involve collecting and analysing the views of community members regarding the residential decisions one is expected to make upon marriage, and their attitudes towards the co-residence of couples. Ideally, this would be followed up by a quantitative investigation to establish the prevalence of these views, and so identify whether the community is characterised by a nuclear, stem, or joint residential pattern. Where data and analysis of this type is lacking, one must settle for an ethnographerôs impression of the communityôs views and attitudes on these matters, surmised through ethnographic observations. By default, this is the approach used here.

Additional steps may be taken to lend support to the identification of the residential pattern in operation in a particular setting. One such step is to measure the frequency with which recently married members of a community are found living in their natal co-residential groups. A distinct tendency for only male, or for only female, newlyweds to be members of their natal groups may confirm the identification of a joint residential pattern. Alternatively, a tendency involving only newlyweds who are the youngest amongst all their siblings, or youngest amongst their siblings of the same sex, would add weight to the identification of a stem residential pattern; so would a tendency involving only newlyweds who are the eldest amongst all their siblings, or eldest amongst all their siblings of the same sex. Finally, a clear tendency for neither male nor female newlyweds to be living in their natal groups lends support to the identification of a nuclear residential pattern.

Another step to take ï particularly when information relating to newlyweds is unavailable ï is to detect what are here referred to as óaversion trendsô within the community. Aversion trends are a logical extension of a residential pattern, and different aversion trends may be expected

under each of the three types of residential pattern. Where the nuclear pattern is in operation (i.e. no one in the community continues to live as part of their natal co-residential group after marriage), we would anticipate an aversion by all married persons for co-residing with any other married persons apart from their own spouse. Where the stem pattern operates (i.e. only one member per group per generation brings a spouse into his or her natal co-residential group), a distinct aversion by married persons for co-residing with any of their married siblings should be evident. In cases where the joint residential pattern operates (i.e. there are several people, all of the same sex, in every group who may bring their spouses into their natal co-residential group), we would expect one of two possible scenarios: either there would be a discernible aversion by married men for co-residing with their married sisters and married daughters, or the aversion would be by married women towards their married brothers and married sons. Since aversion trends involve married persons of all ages, they should manifest themselves across most of a communityôs co-residential groups.

In summary, residential patterns are gauged through ethnographersô evaluations of residential decisions in the community, backed up wherever possible by frequencies of different residential decisions by newlyweds, and by aversion trends. The residential pattern is treated here as a categorical variable which can take three nominal values: joint, stem and nuclear.

CHAPTER 3
Explaining variation in the composition of co-residential groups

3.1 Introduction

Chapter 2 identified a range of terms for talking about, and identifying disparities in, co-residential group composition. Thus equipped, we can confront a question which follows naturally from reflecting upon the composition of co-residential groups: why are groups across the world, and even within individual communities, not identical in their demographic composition?

To answer this requires us to think about how co-residential groups in different cultural contexts assume their initial forms, and the reasons why they later lose or gain particular members. Though many factors are involved, what is of particular interest here is to ascertain the influence (if any) that spatial circumstances and the spatial design of residences may have in bringing about compositional variation or change.

This chapter explores the reasons why co-residential groups are not uniform in their memberships, drawing on literature from the fields of family history and anthropology. A notable feature of these resources is that almost none of the works postdate the end of the 1980s, a fact which requires some explanation.

The present research deals with the occupants of a residence as a group, a discrete entity, whose members are treated as a single collectivity at one point in time. This approach was common prior to the 1990s but is no longer so. Amongst family historians, studies on the ôhouseholdô or ôfamilyô were displaced by the growing interest in the ôlife-course approachô, which focused on the movements and residential decisions of individuals (Hareven 1991: 107).[8] Within anthropology, meanwhile, the trend introduced by Netting et al. (1984) was a move away from studying the demographic make-up of the household (its ômorphologyô) and towards the domestic activities practised or economic decisions made by sub-groups within it: any internal differentiation within the household was brought to the fore (e.g. Wilk (Ed.) 1989) at the expense of viewing or analysing the group in its entirety.

A further reason why the relevant literature did not extend beyond the 1980s was an assumption that theoretical saturation had been reached. By the end of the decade, Kertzer (1991) was able to provide a definitive overview of the factors influencing living

[8] Likewise, within the recent area of social research which deals with co-residence the focus tends to be on the residential choices of particular categories of resident ï mostly of adult children moving back into parental residences, or of the elderly ï rather than on entire groups of residents (see, for example, papers in the *Journal of Marriage and the Family*).

arrangements, and almost no theoretical advances were made in the years that followed (with the exception of Verdonôs monograph, published in 1998). As will be argued below, this assumption overlooked the fact that the literature fails to tackle adequately the role of space and spatial requirements in residential decision-making.

Section 3.2 of this chapter presents the most widely accepted explanatory models for how co-residential groups form and change their memberships. The discussion brings out their weaknesses regarding the role of space, and draws out their similarities. Section 3.3 outlines the part played by socialisation in peopleôs selection of living arrangements; it argues that the weight of this factor is underestimated by both explanatory models. Section 3.4 turns to the role of macro-scale factors, and reviews their impact by referencing examples from family history. The chapter ends by suggesting that, while it may not be possible to integrate all of the relevant factors into a neat theoretical framework, we can gain a better grasp on how and why co-residential groups vary in their composition by studying the residential decisions of inhabitants in particular settings, and identifying associations between co-residential group demographics and other variables across cultures.

3.2 Explanatory models

The formation of co-residential groups and the gain or loss of group members are normally understood in one of two ways. According to microeconomic models, individuals come together in a quest for certain ógoodsô; in some of the literature of anthropologists, they do so in the process of managing various domestic processes necessary for the reproduction of society. Both frameworks are presented below, as they have much in common and are useful in making sense of co-residence. However neither model is particularly helpful in understanding the role of space: this is either left implicit, or evaluated intuitively and demonstrated with anecdotal evidence, creating the impression that it is not worthy of the same theorisation and systematic empirical investigation owed to other explanatory factors.

3.2.1 The role of space in Burch and Matthews' microeconomic model

Let us take, as an example, the microeconomic demand-supply model put forward by Burch and Matthews (1987) to explain óhousehold formationô in developed societies. This posits that residents come together óinstrumentallyô (i.e. as a means to various ends), and that the group that forms as the end-result should be viewed as a ócomposite goodô. Individuals make decisions concerning their living arrangements by considering how they may acquire a satisfactory degree of various economic resources and psychological benefits: physical shelter; storage of property; domestic service; personal care; companionship; recreation; privacy; independence; power; and economies of scale in consumption. A personôs

participation in the co-residential group of his or her choice is designed to provide them with as many as possible of those ócomponent goodsô.

Insofar as certain of the listed ógoodsôï namely, shelter, storage and privacy ï make demands on space, we could extrapolate from this that spatial considerations play a part in co-residential group formation. Burch and Matthews however fail to make this connection in their attempt to explain the modern trend in the West ñtoward separate living in smaller and simpler householdsò. For example, while they recognise that an increased demand for privacy in recent decades might partly explain this phenomenon, they conceive of privacy as an abstract psychological ógoodô rather than a spatial ógoodô associated with residential design and the availability of housing.

3.2.2 The role of space in Wilk and Netting's processual model

By contrast, the anthropologists Wilk and Netting (1984) explicitly acknowledge that spatial circumstances have a bearing on the composition of co-residential groups. According to them, the members of any óhouseholdô negotiate over five processes ï production, distribution, transmission, reproduction and co-residence (ibid. 5) ï and it is through compromise between ñoften contradictory functional imperativesò (ibid. 20) that co-residential groups form and change their membership.

In discussing the activity labelled as óco-residenceô, the authors mention that ñphysical confines and availability of dwelling spaceé condition the size and composition of the household unitò (ibid. 17). They offer examples of situations where residences with extra capacity have given groups the opportunity to recruit additional members such as lodgers; where lack of affordable housing forces groups to retain members for longer than desired because they have nowhere else to go; and where agencies external to the community have dictated the size of its co-residential groups through the design and allocation of new housing.

Despite these examples, the impact that the availability of space or the spatial design of residences has on co-residence is never taken beyond the level of anecdotal evidence to produce theoretical generalisations. This omission is conspicuous, given that the authors offer hypotheses about the other so-called óprincipal activitiesô responsible for shaping households. They propose that labour demands have a predictable effect on óproductionô, resource availability on ódistributionô, and land scarcity on ótransmissionô; but nowhere do they put forward hypothetical trends with regard to óco-residenceô.

3.2.3 Similarities between the two models

The proponents of both of the models outlined above believe (implicitly or explicitly) that spatial considerations have a bearing on co-residential group formation. However, they stop short of providing a framework for understanding how space impacts on residential decisions and living arrangements.

Putting this aside for the time being, a couple of other premises shared by the two models deserve attention. These can serve as starting points towards a fuller appreciation of how co-residential groups form.

a) The role of macro-scale factors

In both models, co-residential group composition is viewed as a solution to a range of requirements. That the requirements are conceived somewhat differently in the microeconomic and processual models ï as ógoodsô on the one hand, and óprocessesô needed to ensure the reproduction of society on the other ï is of less relevance here than the fact that, according to both models, it is the political, economic, technological and social environment which establishes the relative urgency or importance of each requirement in any given setting.

Thus, Burch and Matthews suggest that the modern rise in developed countries of co-residential groups of simple structure results from the recent shift in requirements for ócomponent goodsô. They argue that there is now a greater supply of independence, domestic service, and recreation, and a concomitant lessening of demand for economies of scale and companionship through co-residence. They attribute these transformations to the emergence in recent years of institutional arrangements that allow more individuals to claim their own income; the entry of women into the labour force; and modern developments in communication technology (Burch and Matthews 1987: 503 ff.).

Similarly, Wilk and Netting contend that the five activities involved in their processual model ñvary in their importanceò according to the subsistence system in operation as well as other ñhistorical circumstances of the momentò (Wilk and Netting 1984: 20f.).

At the heart of both arguments is the belief that co-residential group membership is contingent not only on the individual membersô personal circumstances (such as individual budget constraints), but also on the politico-economic, institutional and material conditions in existence around them. This belief likewise underpins a great deal of family history literature.

This idea is readily accepted here. Any discussion of co-residential group formation must accordingly take into account the influence of such macro-scale factors on peopleôs requirements, and on the living arrangement they choose in response to those requirements. With that in mind, section 3.4 draws on studies by family historians to present an overview of how macro-scale conditions impact on co-residential group composition.

b) Motives and rationale behind residential decision-making

The two explanations also share the implicit notion that residential decisions are predicated on self-interest, with each person intent on securing their own personal requirements for ógoodsô or óprocessesô. Thus, co-residential groups form as the result of a mass of individual motives. The fact that some residents fare better than others in fulfilling their personal requirements can be understood as the result of tradeoffs (Burch and Matthews 1987: 499), or of negotiation and bargaining by different parties who use their unequal powers to pursue divergent strategies of self-interest (Wilk and Netting 1984: 20).

This notion seems sensible, if perhaps in need of some refinement. Individuals join or break away from co-residential groups with their own interests in mind, and sometimes choose to compromise their own interests; however, compromise is not always voluntary. It is important to recognise that emotional, financial, and physical coercion and submission may also contribute to the formation of co-residential groups (cf. Verdon 1998: 78f.).

More problematic than a lack of refinement is that neither way of conceptualising residential decision-making takes into account the role of socialisation: this arguably plays a part in making some people appear to the individual decision-maker as natural candidates with whom to strike up a co-residential relationship; others less so; and yet others as ineligible under most conceivable circumstances. Socialisation should be seen as inextricably linked to residential decision-making, and its impact on co-residential group formation needs to be made clear. This is something that section 3.3 considers in greater detail.

3.2.4 Summary of the two explanatory models

In very broad terms, the two models resemble each other. Both suggest that individuals decide whom to share a residence with on the basis of their requirements (either for goods or for the achievement of processes), and that the priority of their requirements is defined in large part by the politico-economic conditions they find themselves in. Peopleôs options are necessarily limited by their personal circumstances, including budget constraints, but also by the decisions of others; especially people with some authority over them. In addition, both models acknowledge that spatial considerations can contribute to the formation of co-

residential groups and the gain or loss of group members, but leave many questions unanswered in this regard.

The discussion has called attention to the need to look more closely at the influence that macro-scale factors and socialisation have on co-residential group membership. We begin with the latter in section 3.3.

3.3 The role of socialisation

With a few notable exceptions (Laslett 1972; Berkner 1975), the significance of social learning for residential decision-making barely gets a mention in anthropological and family history literature. On the other hand, the outcome of socialisation ï normally glossed in the literature as ócultureô ï is widely acknowledged as a factor affecting co-residential group composition (cf. Kertzer 1985: 105).

In historical studies in particular there is widespread recognition of the role played by culture in inhibiting or delaying alterations in living arrangements, even within societies that have undergone fast-paced political and economic changes. This phenomenon has been referred to variously as ócultural inertiaô (Reher 1988: 71), ócultural momentumô (Kertzer 1991: 174) or ócultural time-lagô (Janssens 1993: 20). Similarly, anthropologists sometimes refer to household configurations as ópersisting cultural formsô (Kunstadter 1984).

A rudimentary understanding of socialisation can help explain why communities tend to adhere to traditional living arrangements. Socialisation is a process that takes place throughout a personôs life, mostly at a practical, non-discursive level. It is the integration of past experiences and observations into an awareness of what is reasonable and unreasonable within their society; an awareness which in turn shapes their expectations, attitudes and aspirations (cf. Bourdieu 1977). Socialisation affects decision-making in two ways. First and foremost, it is enabling: it permits one to act ósensiblyô in everyday life and to improvise effectively in new situations without much reflection (ibid. 79). At the same time, however, it is constraining. Social learning always happens under a particular set of historically and socially situated conditions; as a consequence, the dispositions and behaviours of a socialised individual tend to be compatible with those objective conditions, while incompatible behaviours are so unfamiliar to them as to be either unthinkable as courses of action, or automatically dismissible (ibid. 77). This means that, in any given situation, not all rational solutions are equally conceivable, nor does every practical option seem natural or reasonable from the point of view of the socialised person.

This has significant implications for the formation of co-residential groups. By virtue of being socialised, individuals will automatically bypass potential residential options. For example, outside of emergencies, sending a child to live apart from its parents or sharing a home with oneôs adult siblings may not cross anyoneôs mind in certain societies, however practical this may be or potentially advantageous to all concerned. Instead, individuals are prone to making the residential decisions expected of them by others in their community, and to form the living arrangements they came to anticipate since their childhood.

That is not to say that the living arrangements experienced in oneôs own childhood are the only arrangements a person believes to be socially acceptable (contra Laslett 1972: xi). Berkner argues that it is not simply through registering the *composition* of their own co-residential group or of other groups around them that children learn whom they are expected to co-reside with as adults (Berkner 1975: 733). Instead, through observation they come to understand that society imbues some people and not others with a sense of entitlement to remain in their parental residence on an indefinite basis; they sense that certain co-residential group members are subtly or overtly groomed for an eventual departure from their natal group; and they are able to surmise that the admission of certain persons into a co-residential group is an anticipated event, while the presence of others is only ever grudgingly accepted, if at all. Such ñunderlying codesô are mostly ñinferred from surface manifestationsò (Giddens 1984: 16) but may also be reinforced by local inheritance customs (Berkner 1975) and by ñdiscourses, sayings and proverbs, all structured in concordance with the principles of the corresponding *habitus*ò (Bourdieu 1977: 167). Once inculcated with these expectations, individuals are unlikely to set up co-residential groups whose composition falls significantly out-of-step with those of others who have been similarly enculturated.

In short, socialisation limits the scope of residential decisions in a community. Indeed, in certain life-stages there may only be a single conceivable living arrangement that appears ósensibleô to socialised individuals; at those times, deciding whom to share a residence with may not seem to involve any choice at all.

When we consider why people create the co-residential groups that they do, it is not enough to take into account their requirements for certain goods or their need to achieve tasks under particular conditions, personal circumstances and power relations, as the microeconomic and anthropological models would suggest. It is also necessary to acknowledge that various objectively rational ósolutionsô to those needs are virtually unthinkable in certain communities; that socialised individuals may have a learnt anticipation for, or aversion to, co-residing with certain categories of person; and that residential decisions are thus inevitably biased.

3.4 Macro-scale conditions

When individuals make decisions about their living arrangements, they cannot avoid taking into account the political and socio-economic climate of the time and place in which they live, and the opportunities, pressures and constraints that this creates. Every society offers a particular set of conditions ï an economic system; institutions (civic, religious, political, or legal); and a state of medical and technological development ï within which its members must conduct their lives. Such conditions are here referred to as ómacro-scaleô, reflecting their capacity to impact on the decisions and behaviours not just of small numbers of individuals but also of larger populations.

Family historians often attribute the living arrangements of the communities they study to macro-scale conditions. The subsections below use this body of work to consider and illustrate how such conditions can impact on residential decisions and co-residential group composition.

3.4.1 Demographic patterns

At the most basic level, the composition of co-residential groups can be understood as the result of the addition of members through birth, adoption, marriage, or in-migration, and the dissolution of membership through death, marital separation, or out-migration (cf. Bongaarts 1983). These membership transitions may be personal choices, but only to a point. In many ways they are contingent on forces whose powers extend beyond the individual to encompass entire communities.

Having children, for example, is not just the outcome of a personal decision. Broader historical circumstances have a bearing on whether children are born and how long they survive: these may include the existence of family planning policies, or public health and nutritional conditions which are driven in part by political will, financial investment, and the state of medical knowledge or technology at the time. Because these conditions affect entire communities, their demographic manifestations can be viewed and measured as community-scale patterns e.g. fertility, mortality, migration, or divorce rates.

It is common practice amongst family historians to view community-scale demographic patterns as determining what kin are available for co-residence (Kertzer 1991: 170ff.). Thus, low life expectancy and a relatively high age at marriage in various European pre-industrial settings constrained the availability of certain kin: it meant that it was rare for married couples to survive to see the birth of their grandchildren, making it rare for multi-generational co-residential groups to form (e.g. Berkner 1972). Elsewhere, high rates of immigration

expanded the pool of kin available to co-reside with, allowing the formation of populous co-residential groups or groups of complex structure (e.g. Janssens 1986).

Of course, just because kinfolk are present in the community it does not follow that they will necessarily co-reside. With this in mind, demographic patterns are best understood as making particular living arrangements possible or impossible, rather than bringing about specific co-residential group compositions.

3.4.2 Politico-economic systems that treat co-residential groups as economic units

Members of co-residential groups sometimes work together, consume together, or otherwise act as economic units. An inference commonly drawn from cases where this occurs is that the reason for taking up particular living arrangements is in order to maximise efficiency or bring about economies of scale (e.g. Pasternak et al. 1976: 117ff.; Netting 1965) .

If economic efficiency is viewed as one of the ócomponent goodsô or órequirementsô that motivate people to co-reside, then this notion fits comfortably with the microeconomic and processual models discussed earlier. Numerous examples from family history show that in certain situations people place enormous value on the efficiencies they can gain by both living together and acting as economic units. In such cases it is the broader historical landscape that confers importance on these kinds of efficiency, as the examples that follow illustrate.

Example 1: The co-residential group as a labour unit

In 19th century Casalecchio di Reno in Northern Italy (Kertzer 1989), the livelihood of the sharecropping community depended on farming for an absentee landowner, renting a farm on his land to live in, and receiving a share of the agricultural produce. Anyone living on the farm, whether young or old, was contractually bound to work there and nowhere else. The sharecropping system therefore entailed that co-residential groups were also labour units.

Landowners could choose which labour unit to instate on their land, and favoured those containing numerous able-bodied productive adults. When the yearly sharecropping contract came to an end, if the demographic make-up of the workforce was such that it risked the groupôs productive efficiency, landowners could eject them from their home and find others to replace them. To avoid eviction and remain as a sharecropper it was in the farmersô interest to prevent any depletion in their workforce, and they did this in a way that was culturally familiar to them: by retaining adult sons and adult brothers within their co-residential groups and allowing their wives to join them at the farm. At the same time, the portion of agricultural produce received by sharecroppers was not enough to support a large co-residential group population, so sub-groups were encouraged to hive off if the group became too populous.

In seeking the balance needed to retain their sharecropping contracts and support their families, sharecroppers tended to form multi-conjugal groups consisting of parents and married sons or married sets of brothers.

Example 2: The co-residential group as a unit of consumption

Peasant serfs on the feudal estate of Mishino in 19th century Russia lived under a different set of pressures (Czap 1983; Verdon 1998). Serfs were obliged to perform agricultural labour services or pay rent to their lord by farming land which he owned and they held in usufruct, but residential eviction was not a risk since houses belonged collectively to those living in them. Instead, other forms of oppression came into play.

The taxes and rents which serfs owed to their landlord were high. It made sense for parents to want to retain control over their children indefinitely so that they could continue consuming the fruits of their labour. They could achieve this by keeping adult children in the parental residence even after their marriage, compelling them to assist with the economic burden of unproductive co-residents (the very young and the very old), while simultaneously reaping the benefit of the economies of scale afforded by communal living.

In fact, only sons were subjected to this strategy and were allowed to bring their wives into the parental residence. However, the compliance of sons was not wholly voluntary. Fathers had formidable powers, and could threaten sons with disinheritance, refuse them a ópassportô to work outside the estate, or enlist them to the military for a 25-year period of service if they did not agree to retain membership of their natal co-residential group. Moreover, pressure came from the heads of other co-residential groups on the estate, who, in the event of a group defaulting on its fiscal dues, would be expected to pay its share. To avoid this, heads could oppose the dissolution of co-residential groups and enforce their will by threatening to redistribute the land farmed by those groups. These conditions fostered immensely populous multi-conjugal groups which rarely lost male members through out-migration.

In both examples, the co-residence of male married relatives was an 'efficient' strategy suited to its politico-economic and cultural setting. The land tenure system in operation in those two contexts clearly impacted on residential decisions and the composition of co-residential groups.

However, it is important to note that the specific outcomes described above are by no means representative of all sharecropping or feudal systems. For instance, in 19th century Vila-Rodona in Catalonia (DôArgemir 1988), sharecroppers living under a different permutation of legal and economic strictures to those of Casalecchio di Reno made residential decisions associated with a stem residential pattern, rather than the joint pattern evidenced in Casalecchio. In 19th century Nagakiri in central Japan (Befu 1968), severe feudal taxation and

legal restrictions on the dissolution of co-residential groups gave rise to extraordinarily populous groups, as they did in Russian Mischino, but they arose through the practise of a stem residential pattern and not the joint pattern evidenced in Mischino. While peasants in the Russian setting were brought up to expect that all sons could introduce their wives to the parental home, the peasants of Nagakiri were brought up to expect only one son (the heir) to be allowed to do so. Nagakiri parents therefore used the only way they could conceive of to create co-residential groups large enough to meet the demands of feudal taxation: by forbidding adult non-heirs from marrying and leaving their natal group (rather than expelling daughters and introducing their sons' wives, as was the case in Mischino).

Thus, it would not be true to say that a given system of land tenure or type of politico-economic system gives rise to particular living arrangements. The impact of politico-economic systems on co-residential group composition is not quite so clear-cut. Instead, one might say that the convergence of a historically specific set of tenure obligations and ecological, legal, economic, and social conditions create motivations and pressures which bind people together economically as a labour unit, unit of consumption, or tax-paying unit in a residence. As a consequence of this, residential decisions became tied up with economic strategies of production and consumption, affecting the size and structure of co-residential groups.

3.4.3 Inheritance systems

Inheritance patterns and modes of property transmission are widely accepted as factors linked to co-residential group composition (Goldschmidt and Kunkel 1971; Yanagisako 1979: 169ff.; Kertzer 1991: 165f.). The rationale behind this is that children who are due to inherit their parental residence or the land on which it stands may be motivated to retain membership of their natal co-residential group during adulthood, whereas the prospect of dispossession frees them up to dissolve their membership.

Examples from family history bear out this notion. Perhaps more importantly, they draw attention to the mutually reinforcing relationship that often exits between peopleôs inheritance prospects, on the one hand, and residential decisions, on the other. The examples below help illustrate this.

Example 3: Preferential inheritance and the stem residential pattern

In the community of Besal¼in Catalonia during the mid-20th century (Flaquer 1986), farmers who owned land were free to transfer their property to heirs. Estates had to be passed on intact to remain ecologically viable, and Catalan inheritance law determined that the recipient of the entire estate, including the farm, should normally be the eldest son. While the chosen heir was groomed for this role from his birth, non-heirs were given to understand that they could only remain in their parental residence as long as they were unmarried.

Transmission from parents to son did not proceed automatically, though. Instead, the eldest son had to enter a contractual arrangement with his parents upon his marriage. This designated the son as the universal heir upon the fatherôs death and guaranteed provision for the son and his wife while the father lived, but on condition that the son and his wife co-resided with the parents on the farm (and, by implication, contributed to the maintenance of the estate and care of the elderly parents).

Ecological constraints therefore lent legitimacy to the local system of inheritance, and this was used to justify the creation of a contractual residential and economic partnership between parents and their eldest son. Meanwhile, daughters and younger sons had no binding economic or caring commitments towards their parents, but also no stake in the estate or entitlement to bring their spouse to it, and so left their natal co-residential group to marry. These conditions fostered the practice of a stem residential pattern and the formation of two-conjugal groups amongst landowners.

Example 4: Non-preferential inheritance and the nuclear residential pattern

By contrast, the 20th century inhabitants of Santa Mar²a del Monte in the province of Le· n in northern Spain divided their property equally amongst their children after death (Behar and Frye 1988; Behar 1986). This included their agricultural land, their house, and all their moveable property (even foodstuffs), which were carved up meticulously and dealt out by lot amongst every daughter and son. In the interests of equity, the parental residence was portioned out section by section or room by room, resulting in situations where, for example, one child would own a room but another the entranceway leading to it. Tradition and social pressure were sufficient to enforce this system without recourse to legal arrangements.

Children grew up anticipating that they would leave the parental residence and set up their own independent co-residential group upon marriage. This could be rationalised by two things. First, their claim to their parentôs property was assured regardless of whether they kept up any form of relationship (economic or co-residential) with their parents; no greater share could be expected for staying home to look after an elderly parent. Secondly, there was no guarantee that the portion of the parental residence which the child would receive would be sufficiently large or coherent to accommodate their own spouse and children.

The local inheritance system therefore complemented and helped rationalise childrenôs learnt anticipation to dissolve their membership of their natal group when they reached adulthood, and a nuclear residential pattern was evidenced in the living arrangements of Santa Mar²a del Monte.

These two examples serve to illustrate that inheritance prospects ï which are best understood when placed within their historically specific social, legal, and economic context ï can sway residential decisions in certain directions. The nature, timing, and amount of inheritance that a person anticipates receiving can help them decide whether it is worthwhile retaining membership of their natal co-residential group. The result is an affinity between types of inheritance system and types of residential pattern, with favouritism in the choice of heir aligned to the stem residential pattern, and a lack of partiality aligned to the nuclear residential pattern.

3.4.4 Welfare systems

In many societies, social convention decrees that those who cannot maintain their existing living arrangements should be looked after by their relatives or acquaintances to one degree or another. Laslett coined the term ónuclear hardshipô to refer to the difficult circumstances

that individuals who live independently encounter following illness, the death of a spouse, or economic misfortune (Laslett 1988). One way of mitigating against nuclear hardship is to offer someone in difficulty space in oneôs residence, and therefore membership of oneôs co-residential group, normally on a temporary basis (ibid. 155). Where this occurs, co-residential group size and structure is affected.

Many instances of this kind of private welfare provision involve taking in an elderly parent. This phenomenon is so widely acknowledged that it does not require illustration through example. The convention also encompasses the temporary intake of a distant relative or a married child and their spouse when they have been unable to secure residential premises of their own. This was exemplified in living arrangements in the 19th century town of Tilburg in the Netherlands, at a time characterised by a high rate of job-related immigration and an under-supply of housing (Janssens 1993).

Where public institutions exist for the provision of welfare, it may not be necessary to invite relatives or acquaintances in difficulty into one's co-residential group. The provision of social housing, nursing homes, supported housing, or non-wage income (e.g. through pensions or disability payments) allow those suffering from nuclear hardship to find alternative accommodation or means of maintaining their existing living arrangements. As an example, public welfare provision has accounted for many of the no-conjugal groups found in recent decades in the United States (Heaton and Hoppe 1987; Arcury 1984).

The existence of public welfare institutions should therefore be seen as expanding the range of residential options available to the vulnerable, and potentially reducing instances where co-residential groups have had to alter their membership to accommodate those in need.

3.4.4 Housing availability

Co-residential groups do not exist without residences: we can therefore expect co-residential group composition to be influenced by the availability or non-availability of housing. Availability is driven by a complex network of macro-scale factors: economic (e.g. investment in housing schemes), social or legal (e.g. property transfer rights) and political (e.g. planning policies). It is also affected by the cost of construction, and the availability and nature of construction materials. In societies with housing markets, factors such as pricing, levels of demand and supply, rental opportunities, and construction and vacancy rates come into play, while the institutional provision of affordable housing, housing subsidies, or social housing can further complicate this picture.

Investigation of these factors has been limited within family history. Nevertheless, this body of literature contains plenty of examples where housing shortages have been held responsible for peopleôs choice of living arrangements. A few historical examples are sufficient to show the impact of housing availability on co-residential group composition without needing to venture into the literature of other disciplines (e.g. on modern housing).

A shortage of housing can hinder the establishment of new co-residential groups. In societies where newlyweds are normally expected to leave their parental residence and set up a new co-residential group together, a common solution when new premises cannot be secured is for one person to retain membership of their natal group and for their spouse to join them as a new member. This happened during the mid-19th century in the Languedoc village of Cruzy in France, for example, when immigration and the rising price of real estate associated with the boom in viticulture led to a housing shortage (Smith 1984: 83). An alternative solution elsewhere is for both spouses to remain resident in their respective natal groups for a few years, living apart and so avoiding a change to the structure of any existing group (e.g. Behar 1986; O'Neill 1987; Befu 1968). The choice of solution comes down to social convention and the availability of space in the parental residence.

Housing shortages may also motivate people to form co-residential groups with strangers, friends, or relatives with whom they would not normally co-reside. For instance, owner-occupiers who have spare rooms in their residence may take the opportunity to earn rent by taking in lodgers, thus expanding the membership of their co-residential groups (e.g. Berkner 1975). Alternatively, expedient living arrangements may arise. This was the case in Victorian England, where urban dwellers who had been priced out of all other types of housing chose to live together in vastly overcrowded rooms in low-rent slum tenements known as órookeriesô (Evans 1997).

Generally speaking, when housing demand outstrips supply, co-residential groups retain members they would otherwise lose, or form new configurations containing individuals who would normally reside separately. Such residential decisions can impact on group structure (c.f. Mutchler and Krivo 1989), but their more common effect is on the size of co-residential groups, which is why housing shortages are often associated with overcrowding.

3.5 Understanding variation in co-residential group composition

The aim of this chapter has been to find out why co-residential groups are not uniform in their memberships. The brief answer is that co-residential group composition is the result of multiple residential decisions, and that residential decision-making is contingent on a host of factors. The quest for ógoodsô, the need to carry out óprocessesô, the influence of social learning, and considerations stemming from the broader social and politico-economic environment have all been discussed as contributing to residential decision-making.

Spatial considerations also play a role. Their bearing on living arrangements is clearest in situations where there are housing shortages, though their broader relevance to residential decision-making is alluded to in both the micro-economic and the processual explanatory models. Yet there is a limit to how much we can learn about this from the literature of anthropology and family history, which spare little thought for the size and design of residences. For this we need to turn to another source of data, the ethnographic record, which allows us to study co-residential groups alongside the residences that they occupy.

So far we have been able to list the major factors which contribute to variation in the demographic make-up of co-residential groups. However, as the historical examples in section 3.4 amply demonstrate, contributory factors tend to act together in concert. While it is possible to argue that certain factors ï say, inheritance systems ï can sway residential decisions in one direction or another, it is not easy to unravel the interplay between the various factors, or determine which factors people give greater or lesser weight to at different times. For this reason, it is doubtful that a coherent theoretical framework could be formulated that could fully explain variation in co-residential group composition.

Rather than attempt to create such a framework, the chapters that follow will use the ethnographic record to begin to build on what the literature has already revealed. Two different approaches will be used to help us get a better grasp on the issue of variation in co-residential group composition.

3.5.5 Understanding residential decisions

The first approach is to *understand residential decisions made in particular contexts*. Instead of continuing to discuss factors and decisions in the abstract, Chapter 5 will use three communities as case studies and focus on the particular factors relevant to those settings.

The aim of Chapter 5 is to make sense of the residential decisions people make on the ground. Within each of the three communities, inhabitants have been socialised with similar

expectations regarding co-residence, live under the same institutions and demographic and macro-economic conditions, and carry out their residential decision-making with reference to those things. Chapter 5 treats the received wisdoms and community-wide conditions in the same way as most inhabitants would: as ógivensô which the inhabitants can embrace, manoeuvre around or contest as they strive for a good quality of life. The investigation will not be concerned with explaining the origins of those ógivensô,[9] but with teasing out the residential decisions which the inhabitants have made within the three different contexts.

In delving into the inhabitantsô residential decision-making, the investigation also reveals how significant spatial considerations have been in shaping the living arrangements in the three communities. The findings from Chapter 5 should therefore be seen as developing and extending our understanding of how co-residential groups form and why they change their composition.

3.5.6 Searching for regularities

The second approach for getting to grips with variation in co-residential group composition is to *search for regularities*. Anthropologists such as Netting (1982), Pasternak et al., (1976) and Hajnal (1982) have already made efforts to establish empirical associations between co-residential groups of particular composition and various economic or demographic variables.[10] Chapter 6 will continue this tradition by seeking regularities in the ethnographic record between the composition of co-residential groups and the spatial attributes of their residences. While this may do little to improve our understanding of why groups vary in their demographic composition, what it can do is help us move towards a better appreciation of the scope of variation, and the degree of standardisation across cultures.

These two approaches set the agenda for Part II of the thesis.

[9] The politico-economic systems, demographic patterns, inheritance systems, and social, legal and religious institutions in the three communities, as well as the notions instilled in the inhabitants of the three communities through socialisation, have all undoubtedly come about in complex and historically contingent ways. Understanding their origins requires extensive historical investigation that lies well beyond the scope of this research.

[10] Netting (1982) found a direct correlation between co-residential group population size and co-residential group wealth; Pasternak, Ember and Ember (1976) found a link between co-residential group structure and the residentsô mode of subsistence; and Hajnal (1982) an association between residential patterns and a communityôs typical age at marriage.

Part II:

The Ethnographic Record

CHAPTER 4
Description of the ethnographic sample

4.1 Introduction

Part II of this thesis turns from the literature of anthropology and family history to the ethnographic record, focusing on empirical data from 14 ethnographically recorded communities. This data is used to develop a better understanding of variation in the membership of co-residential groups, and a better understanding of how co-residential group membership is affected by spatial considerations, such as the availability of space within residences (Chapter 5); it is also used to determine whether the basic demographic characteristics of co-residential groups can be inferred from the spatial attributes of their residences (Chapter 6).

The aim of Chapter 4 is to introduce the sample, providing an overview of the nature, range, quantity and quality of the data used in Part II. Section 4.2 explains the criteria used to select the communities making up the sample, and describes some of the geographical and politico-economic diversity that exists among the selected communities. Next, section 4.3 sets out the definition of ña residenceô used in this thesis, and provides a flavour of the variety in the architectural forms included in the sample. Finally, section 4.4 describes the sampled co-residential groups in terms of their demographic characteristics (population size, structure, and residential pattern). Throughout the chapter, reference is made to a series of appendices that provide additional information about the communities in the sample.

4.2 The fourteen communities

Three criteria were used to select which communities could be included in the sample. These criteria are described below. Some of the variation amongst the chosen communities is then outlined.

4.2.1 Selection criteria

Criterion 1: Information about co-residential group demographics

The most important pre-requisite was a description of the composition of some (or all) of the co-residential groups in a community. Excluded from the sample were communities where the number of inhabitants per residence was known but there was insufficient data to understand how co-residential groups were structured, e.g. Marchandôs study of 26 compounds and their inhabitants in the Nigerian Hausa settlement of Birnin Zaria (Marchand 1993). While Trovaôs study of Pobia (1989) omitted some population data, it contained

enough information to derive the structure of co-residential groups and the residential pattern practised by its occupants, and was therefore included in the sample.

Criterion 2: Information about residences

A community satisfying the above criterion was only included if information was known about the accommodation of co-residential groups. This was vital in order to confirm that all persons classified as members of a single group actually shared sleeping accommodation in what could clearly be defined as a single residence (see section 4.3), and that no persons who regularly or periodically slept within the same residence were mistakenly assigned to separate groups.

For the purposes of this study, residences allocated by a government or any other external authority were discounted. Their exclusion was based on the assumption that the ófitô between co-residential group composition and residences would be closer within the private housing sector, where occupants are relatively free to choose or modify their accommodation according to their needs.

As section 6.2 explains, four categories of data were considered essential with regard to each residence: the number of spaces used for sleeping; the number of spaces used for cooking; the area of all the enclosed spaces used by the inhabitants on a daily basis; and the area of the residenceôs ground-plan. Where one or more of these specifications was missing the community was excluded from the sample, even if schematic plans of residences and detailed demographic data about co-residential groups existed. Gulickôs study of 87 co-residential groups in the Lebanese Greek-Orthodox community of Al-Munsif (Gulick 1955), or Sweetôs monograph on Tel Toqaan in Syria (Sweet 1960) are such examples.

However, an exception was made for Ban Touei, whose residences were documented only in outline by Cl®ment-Charpentier and Cl®ment (1990). The reason for its inclusion is that, of all the communities that were identified as satisfying the first criterion, it alone was characterised by a stem residential pattern. The opportunity to examine such a community was considered too valuable to overlook, given that the residences of Ban Touei have at least some basic architectural information on record.

Criterion 3: Information on at least ten co-residential groups and residences per community

Among the communities which were eligible for inclusion according to the criteria above were several in which every co-residential group and occupied residence had been recorded by the ethnographer. In most cases, however, the proportional coverage was much lower, and

the sample either small in absolute terms, statistically unrepresentative of the parent population, or both.

Theoretically, variation within individual communities in either the composition of co-residential groups or in the design of residences may be important for determining whether co-residential group demographics can be inferred from the spatial attributes of residences. For this reason, it is essential that any variation that exists within a community is represented by that community's sample of co-residential groups and residences.

A third criterion for inclusion in the sample was therefore established, by setting a minimum threshold for the number of recorded groups and residences per community. A total of ten groups and residences was deemed sufficient to give an idea of the extent to which co-residential groups and private housing differ in a particular community.[11] An important consideration was whether the ethnographer who recorded the residences had justified his or her selection: communities were included only if it was possible to assess whether the sampled residences represented a broad or narrow view of the range of variation in the community.

Ethnographic reports which illustrate just one or two of a communityôs ótypicalô or óexceptionalô residences abound in the ethnographic literature. These were excluded from the sample, having clearly failed to meet our criterion for intra-community variation. A handful of reports provide a more focused investigation of living arrangements yet still fail to meet the threshold set here, and were therefore also excluded: examples include Grahamôs monograph on the Mexican Rar§muri settlement of Rejogochi (Graham 1994), and Larsson and Larssonôs (1984a, 1984b) report on Tsawna housing in Botswana.

Only one community was incorporated in the sample despite having fewer than ten recorded co-residential groups: Willow Lake. The entire population of this community was distributed over just seven residences, and was included here as an example of a small-scale community.

Other considerations

Apart from the three criteria described above, several other practical factors limited the selection of communities that made up the sample. Some cases which may have been eligible for inclusion did not have the chance of selection because the relevant reports were not readily available for consultation. Examples include Kampôs (1982) study of the Syrian

[11] The decision to set the threshold at ten was pragmatic. If eligibility had been restricted only to those communities where enough data was available to form a statistically robust dataset, very few communities would qualify for inclusion in the sample.

community of Darnaj, and MacDougallôs (1971) investigation of Rangama in Sri Lanka. My own language limitations meant that reports not written in either English or French were not considered. Finally, time limits on the present research did not permit the inclusion of all cases that were found to be eligible, such as those in Mali documented by Walicka Zeh (2000).

4.2.2 The fourteen communities: an outline

Fourteen communities were chosen for the sample. Their location and several key facts about each is shown in Figure 4.1. In choosing these communities, particular attention was paid to ensuring there was variation in their location and scale, their administrative importance within their respective regions, and their economic systems.

As most of the communities that qualified for inclusion in the sample were recorded by ethnoarchaeologists, the sample is coloured by skews in the nature and current state of ethnoarchaeological scholarship. From the map it is clear that many of the chosen communities are situated in and around south-west Asia. To place this in context, most ethnoarchaeological research on ôarchitecture and domestic spaceô published in the last 30 years of the 20th century focused on this area (David and Kramer 2001: 256f.). To widen the geographical scope of the sample, various ethno-architectural studies were included: this expanded the selection within Europe (to incorporate Greece), and brought in parts of south-east Asia (Laos and Indonesia) and Africa (Morocco and Nigeria).

Most of the communities in the sample subsist on mixed farming and, as such, are typical of the simple, non-industrial societies favoured by ethnoarchaeologists with an interest in architecture (David and Kramer 2001: 185). However, one community (Willow Lake) instead consists of hunter-gatherers, and a further five communities (Capileira, Denpasar, Ibadan, Marrakech and Anegondi) are characterised by highly complex economies, including housing markets and tertiary or quartenary employment sectors.

Further dimensions of variation exist in the sample. Most of the 14 communities have no administrative powers within their local areas, but four are urban centres with administrative jurisdiction over their surroundings (Denpasar, Ibadan, Marrakech and Anegondi). In terms of their ethnic makeup, only three communities are alike (the Kurdish communities of Aliabad, Hasanabad and Karapinar), but all the others differ from one another. There is also considerable diversity in the communitiesô faiths and religious practices. A summary of this socio-economic information can be found in Appendix A.

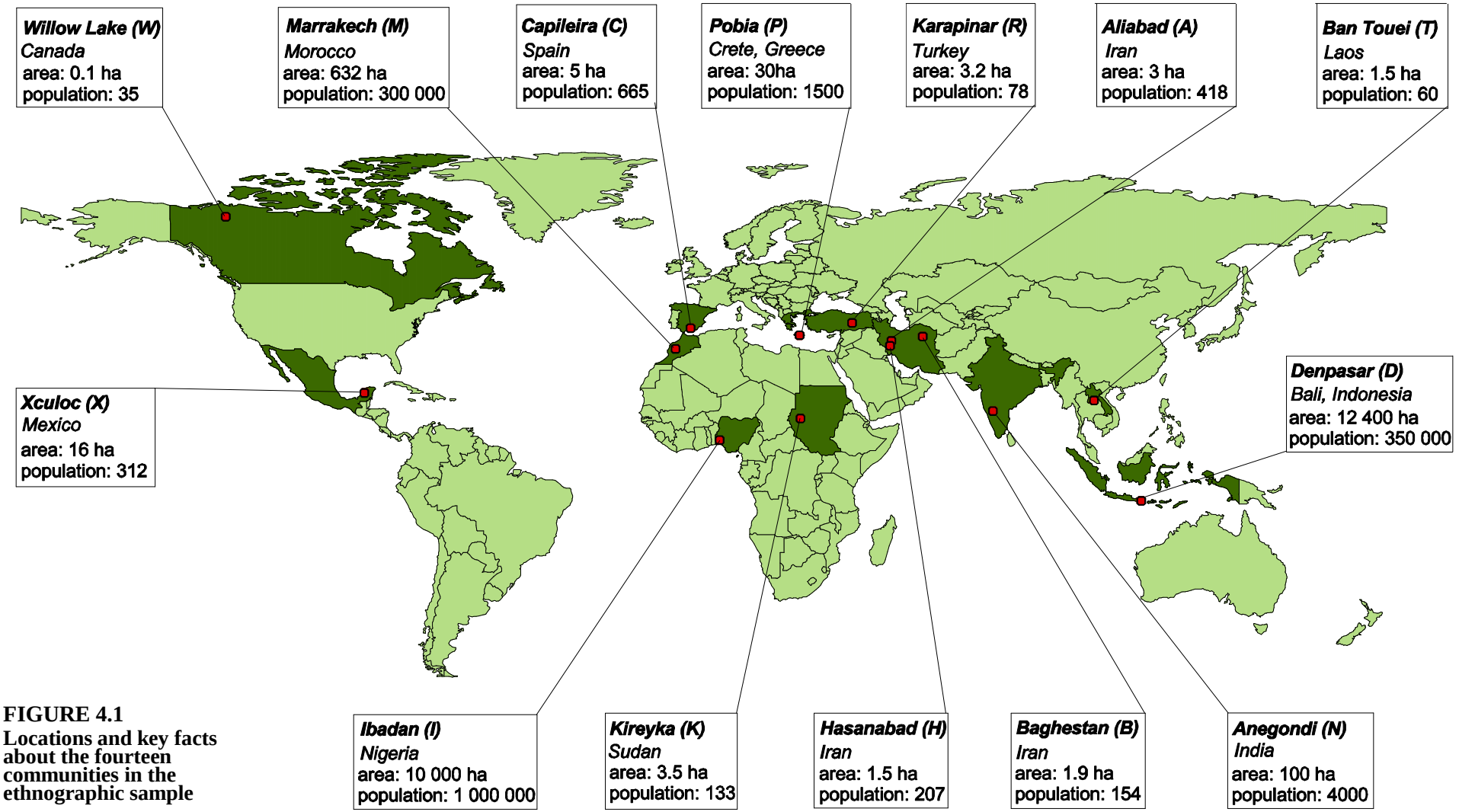


FIGURE 4.1
Locations and key facts about the fourteen communities in the ethnographic sample

4.3 The 368 residences

By definition, the members of a co-residential group are those individuals who use sleeping accommodation located within a single residence (see section 2.1). A prerequisite for distinguishing one co-residential group from another and ensuring that persons are assigned to the correct group is a clear and consistent conception of what a residence is, the spaces that belong to it, and where its boundaries lie. Before describing the 368 residences that make up the sample it is important to explain precisely how residences have been defined for the purposes of this research.

4.3.1 Definition of a residence

In the original ethnographic reports from which the data was drawn, all but two of the sampled residences were illustrated and labelled with the identifying code assigned to their occupants, either in the form of individual plans or as part of a settlement plan.[12] These diagrams reveal that ethnographers had a common understanding of what a residence consists of: a set of spaces which directly or indirectly communicate with one another, with at least one enclosed space amongst them designated for sleeping.

Harder to define are the outer limits of a residence. The ethnographic reports indicate that sometimes those who sleep within a set of interconnecting spaces own storerooms or other spaces near to, next to, or at some distance from their sleeping accommodation, which they can access only by travelling outdoors along a road or public space. It is not uncommon for such displaced rooms to be considered part of the residence (e.g. Delaigue 1988: 76ff.). Here, the view was taken that a residence is delimited by any ópublicô transitional spaces located adjacent to, and allowing entry into, the set of intercommunicating spaces.[13] Any room separated from a set of intercommunicating spaces by a ópublicô pathway (e.g. a road or alley, or a communal corridor in the case of an apartment block) is here considered to lie beyond the residenceôs boundaries.

To summarise: a residence consists of an enclosed space dedicated to sleeping and any spaces which directly or indirectly communicate with it, up to but excluding any ópublicô transitional spaces. Some peripheral areas that lack clear physical boundaries (e.g. unfenced yards, entrance pathways or driveways) may present problems to this definition even when they are privately owned and directly accessible from the residence without passing through a ópublicô space. For the sake of consistency, these types of spaces have been disregarded.

[12] The exceptions are residences H1041 and H1043 in Hasanabad. Various unlabelled rooms in the village plan (Watson 1979: Figure 3.2) probably belong to these residences, but it has not been possible to assign them to individual groups without further information.

[13] A transitional space should be regarded as ópublicô if a wide variety of people, including individuals whose sleeping quarters are not situated nearby, are authorised to use it.

4.3.2 The 368 residences: an outline

Across the 14 communities, 368 residences were defined in this way (two of them notionally, in the absence of labelled ground-plans). Each was assigned a five-digit identifying code beginning with a letter indicating the community to which it belongs. The number of residences per community ranged from seven in Willow Lake to 67 in Aliabad, while the proportion that was sampled ranged from under one per cent to 100 per cent (Table 4.1).

TABLE 4.1 Sample size from each community

		Sample	Total housing stock		Occupied housing stock	
Community		**n**	**N**	**% sampled**	**N**	**% sampled**[a]
A	Aliabad	67	67	100	67	100
B	Baghestan	29	30	97	29	100
C	Capileira	12	386	3	194	6
D	Denpasar	13	>10,000	<1	>10,000	<1
H	Hasanabad	35	36	97	35	100
I	Ibadan	10	>10,000	<1	>10,000	<1
K	Kireyka	28	37	76	28	100
M	Marrakech	11	>10,000	<1	>10,000	<1
N	Anegondi	47	>650	<10	650	7
P	Pobia	39	>376	<10	376	10
R	Karapinar	17	21	81	17	100
T	Ban Touei	12	13	92	13	92
W	Willow Lake	7	7	100	7	100
X	Xculoc	41	41	100	41	100

[a] *This figure also represents the proportion of sampled co-residential groups in each community*

Appendix B contains plans of ten of the sampled settlements, showing the spatial distribution of the residences. The locations and outlines of 73 sampled residences could not be shown because plans dating to the œethnographic presentô were not available for Denpasar, Ibadan, Marrakech and Pobia.

As the plans show, the shape and size of residences differ between communities, and vary in dimensions even within individual communities. By and large, residences belonging to the same community share more similarities than residences belonging to different ones. This is true of their basic form, their materials, the process by which they were constructed, and their expected life-span, which are described in Appendix A.

To give a flavour of the variation in the forms of residences across the sample, Figures 4.2 to 4.4 show the internal layout of a ótypicalô residence from each of the 14 communities. The same illustrations indicate which spaces were enclosed (i.e. roofed and walled on all sides), and the location inside the residence where everyday activities, such as sleeping, cooking, eating meals, and congregating, are carried out by the occupants.

Comparison of the plans reveals a number of salient differences between communities. One major difference is in the ratio of enclosed to un-enclosed spaces. Another is room shape: while residences in most communities are made up of agglutinative rectilinear rooms, residences in Kireyka and Xculoc generally contain free-standing curvilinear rooms. The presence of multiple storeys is also not consistent, with upper storeys not appearing at all in Kireyka, Willow Lake, and Xculoc. Further information about the types of spaces and room functions one might expect to find in residences belonging to each of the communities is provided in Appendix A.

Although residences from the same community have features in common, no two cases are identical in every way. In fact, within four of the communities (Capileira, Denpasar, Anegondi, and Pobia) architectural disparities are sometimes striking. While most of the residences in those communities were built in the óvernacularô tradition, others were designed by professional architects in non-traditional styles, or were older buildings that have undergone extensive renovation or modernisation.

The style, age, or construction materials of residences were not, however, primary considerations in the analysis of the residences. The residences were instead broken down into areal measurements and room counts, as explained in Chapter 6. Appendix C tabulates the spatial attributes of each residence in the sample and offers a descriptive summary for each of the 14 communities, while Appendix D explains how those attributes were defined in each community to ensure consistency across the sample.

Other types of analysis were not attempted. One possible alternative would have been the use of space syntax techniques (Hillier and Hanson 1984; Hillier et al. 1987), which have been used elsewhere to quantitatively and graphically describe the spatial configuration of residences (e.g. Orhun et al. 1995; 1996; Elgohary and Hanson 1997; Hanson (Ed.) 1998; Trova 1989). A residenceôs spatial configuration regulates how frequently its inhabitants are likely to encounter one another, and can therefore reflect aspects of the inhabitantsô social relationships while, at the same time, reinforcing and reproducing them. Of particular interest

FIGURE 4.2 Left: examples of residence plans from Aliabad, Baghestan, Capileira and Denpasar. Right: room functions in the same residences

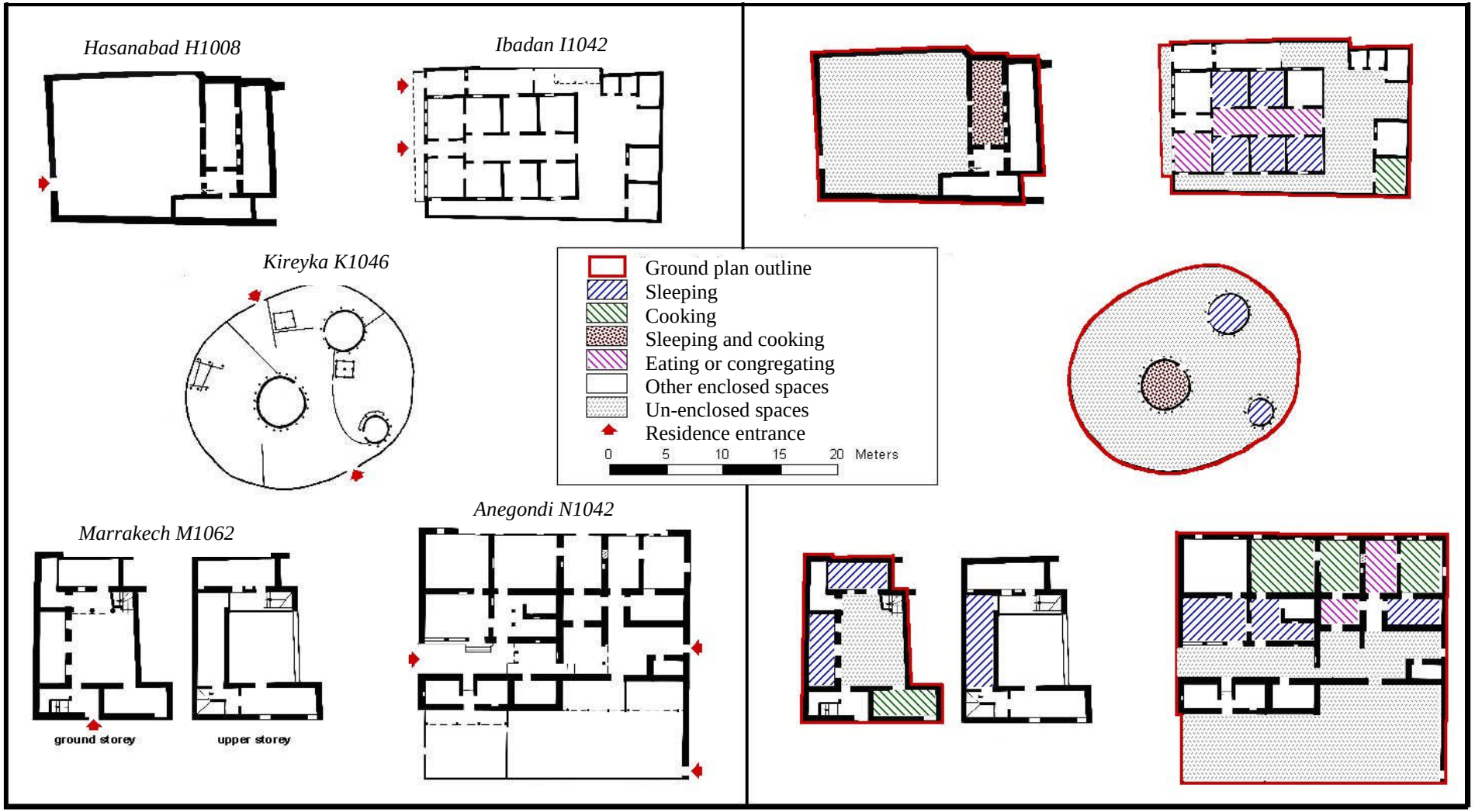


FIGURE 4.3 Left: examples of residence plans from Hasanabad, Ibadan, Kireyka, Marrakech and Anegondi. Right: room functions in the same residences

FIGURE 4.4
Left: examples of residence plans from Pobia, Karapinar, Ban Done Noun (immediately outside Ban Touei), Willow Lake and Xculoc.
Right: room functions in the same residences

to the present research is Gabrilopoulos et al.ôs finding (2002) that a residenceôs ópermeability graphô, representing how its internal spaces relate to each other, may show marked similarities to the inhabitantsô ópatrilineage treeô, a diagram depicting their kinship links. This discovery raises the possibility that a discernible association may exist between categories of spatial configuration and types of co-residential group structure.

The decision not to use space syntax methods in this project stems from practical considerations. Studies such as those listed above usually analyse no more than twenty, thirty or forty residences; even on such a small scale, detecting patterns in the results is not a straightforward affair. Analysis and comparison of the 368 residences in the present sample would have been time-consuming and complex. However, it should be considered a potentially rewarding avenue for future research.

Also for practical reasons, this study did not include any form of longitudinal analysis. Investigating the relationship between the spatial attributes of residences and the composition of co-residential groups at two or more points in time could yield insights on how one variable affects another: information crucial for inferring causes and effects. However, the data needed to accomplish this existed for only a handful of the sampled residences and groups, and was limited to just two of the communities, Ibadan and Marrakech (Schwerdtfeger 1982). As with space syntax analysis, longitudinal analysis should be borne in mind as a potentially fruitful approach for the future.

4.4 The 368 co-residential groups

Once a clear definition of a residence had been determined, occupancy of the sampled residences could be verified by checking which residence individuals slept in. The membership of 368 co-residential groups was thus established. Notably, this includes a full census (i.e. 100% sample) in seven of the 14 communities.[14]

Every co-residential group was assigned the same five-digit identifying code as the residence accommodating it. Basic demographic information about each group appears in Appendix E. For ease of reference, one member of each group has been designated as its head. That person is usually the man or woman under whose name the residential property is held; any assumptions made about headship are spelled out in the introduction to Appendix E.

[14] The percentage of co-residential groups sampled from each community corresponds with the percentage of occupied private housing sampled. The values are shown in the final column of Table 4.1).

The following subsections describe the entire sample by summarising how the values of the demographic variables vary across it.

4.4.1 Size

Data on population size was available for 340 of the sampleôs co-residential groups (92%). The only missing data was from Pobia, where the number of children in occupation in most of the residences was not recorded. The total number of inhabitants distributed across the 340 groups was 2,336.

Table 4.2 shows data on the size of co-residential groups within each community. The mean population sizes in Denpasar, Marrakech, and Ibadan appear to be much higher than elsewhere; these high values may be truly representative of the make-up of the three communities or, alternatively, might be attributable to the small size and unrepresentativeness of the samples drawn from them. The mean population size for the sample from Capileira is relatively low (μ=3.3); in this case, the mean is likely to be a true representation of co-residential group population size in this community, since the mean from a further independent sample (Delaigue 1988: 111) was similarly low (n=27, μ=3.4, s.d.= 2.36).

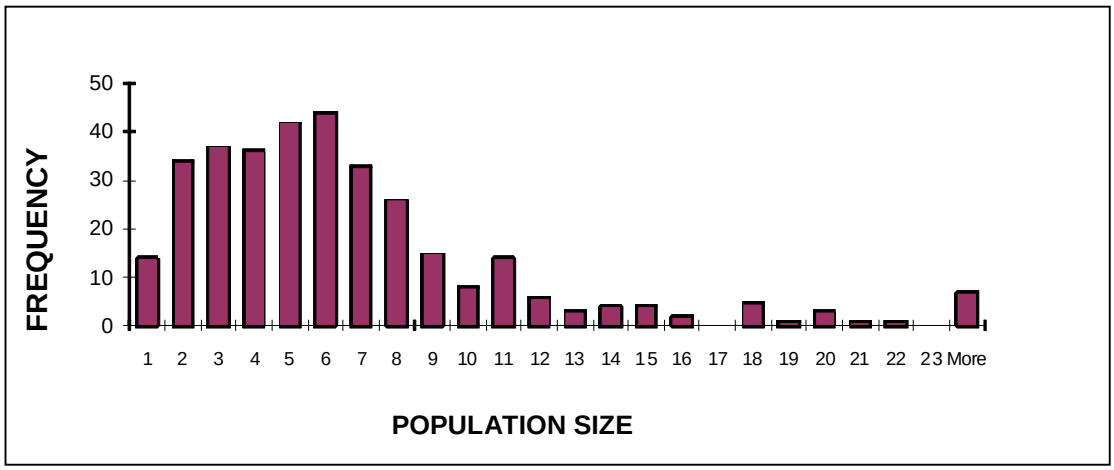
TABLE 4.2 Co-residential group population size in the fourteen communities

Community	Co-residential groups n	Population size			
		Max	Median	Mean	Standard deviation
* Aliabad	67	15	6	6.2	2.92
* Baghestan	29	20	5	5.3	3.37
* Hasanabad	35	14	5.5	5.8	3.01
* Kireyka	28	13	4	5.3	2.92
* Karapinar	17	13	4	4.6	2.87
* Willow Lake	7	8	4	5.0	2.00
* Xculoc	41	38	7	7.6	5.78
Capileira	12	6	3	3.3	1.71
Denpasar	13	25	15	14.5	6.06
Ibadan	10	50	18.5	23.7	15.90
Marrakech	11	24	10	11.5	5.65
Anegondi	47	20	6	6.9	4.47
ÀPobia	39	?	?	?	?
Ban Touei	12	8	4.5	4.4	2.19

** the sample is a census of the entire community*
À*figures for Pobia not known*

Although there are marked differences between the 14 communities in terms of the maximum number of inhabitants per residence, across the entire sample there is a tendency for occupants to limit their numbers to a dozen or so (Figure 4.5). The average of the distribution is 6.9 ï a figure which seems surprisingly high from a modern European perspective[15] ï but values vary substantially around the mean value (standard deviation is 5.87).

FIGURE 4.5 Co-residential group population size in the sample



4.4.2 Structure

Information was available on the structure of all 368 co-residential groups in the sample. In none of the communities do groups of no-conjugal structure exceed one third of the sampled co-residential groups, while groups of one-conjugal structure are predominant in almost every community (Table 4.3). It is not clear from the available data whether the remarkably high frequency of multi-conjugal groups in Denpasar and Ibadan is a factor of the small and unrepresentative samples drawn from those communities, or whether it reflects a genuine deviation from this general pattern.

[15] For the sake of comparison, it may be noted that mean population size of households in England was a mere 2.4 across every type of accommodation (Department of Communities and Local Government, 2007). The latest published figures relate to 2004-2007.

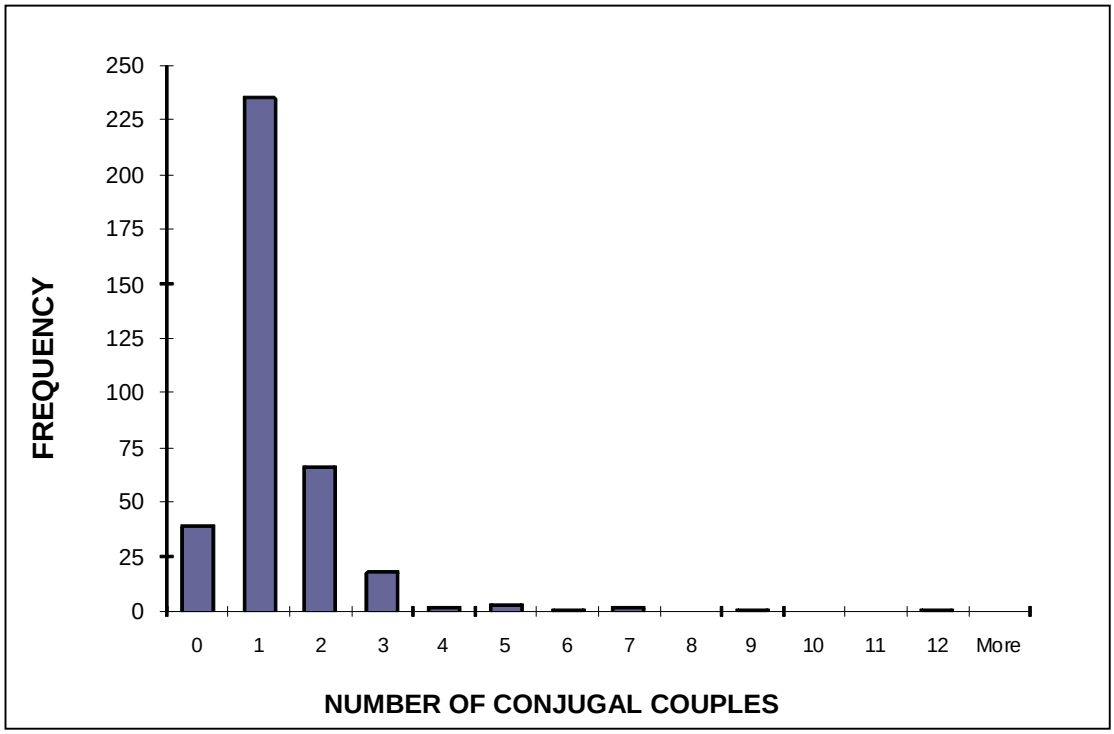
TABLE 4.3 Co-residential group structure in the fourteen communities

Community	Co-residential groups	Structure		
		no-conjugal	one-conjugal	multi-conjugal
	n	%	%	%
* Aliabad	67	9	63	28
* Baghestan	29	10	86	4
* Hasanabad	35	23	57	20
* Kireyka	28	14	72	14
* Karapinar	17	29	89	12
* Willow Lake	7	0	85	15
* Xculoc	41	7	49	44
Capileira	12	17	83	0
Denpasar	13	0	15	85
Ibadan	10	10	10	80
Marrakech	11	0	55	45
Anegondi	47	6	60	34
Pobia	39	3	94	3
Ban Touei	12	25	67	8

** the sample is a census of the entire community*

Across the sample as a whole, one-conjugal groups occur most frequently (Figure 4.6). Although multi-conjugal groups (n=94) outnumber no-conjugal groups (n=39), a high degree of structural complexity remains a relatively rare phenomenon. Denpasar, Xculoc and Ibadan contain the most structurally complex groups.

FIGURE 4.6 Co-residential group structure in the sample



Data on the number of conjugal bonds which exist among the members of a co-residential group provides crucial information about the groupôs structure, but leaves us with an incomplete picture of the groupôs overall composition. Appendix E complements this basic structural classification using diagrams that set out the kinship connections among residents, together with additional comments which clarify those links.

It is worth noting that co-residing couples are most commonly related by parent-child bonds, whereby one couple are the parents of a man or woman in another conjugal pair living within the same residence (Table 4.4).

TABLE 4.4 Kinship bonds between co-residing conjugal couples

Community	Number of co-residential groups that contain:			
	Married parent and married child	Married pairs of siblings	Co-spouses	Married couples with distant or no relationship
	n	***n***	***n***	***n***
* Aliabad	15	6	0	0
* Baghestan	0	0	0	1
* Hasanabad	1	4	0	2
* Kireyka	2	2	1	0
* Karapinar	1	0	0	1
* Willow Lake	1	0	0	0
* Xculoc	15	5	0	0
Capileira	0	0	0	0
Denpasar	7	6	0	3
Ibadan	3	7	7	6
Marrakech	4	2	0	1
Anegondi	6	9	0	2
Pobia	1	0	0	0
Ban Touei	1	0	0	0
Total	57	41	8	16

** the sample is a census of the entire community*

4.4.3 Residential pattern

The residential pattern in operation in the fourteen sampled communities was deduced wherever possible on the basis of ethnographersô evaluations of what inhabitants consider to be ónormalô residential decisions and óappropriateô living arrangements. The residential circumstances of newlyweds, together with indications of aversion trends in the community, were brought in as additional evidence wherever possible. The relevant evidence is reviewed in Appendix F.

As the quality of the evidence varies from case to case, identification could not be made with an equal level of confidence for each community. Confidence was higher where the ethnographer gave an unambiguous report of the inhabitantsô attitudes or expectations towards living arrangements; it was lower where the ethnographer was not explicit on this issue, or where only a small fraction of the living arrangements in the community had been recorded. The óprobableô or ólikelyô residential pattern in each of the communities is shown as

a cell shaded in grey in Table 4.5; the labels refer to a higher or lower level of confidence, respectively, in the interpretation of the evidence.

TABLE 4.5 Residential patterns in the fourteen communities

Community		Nuclear	Stem	Joint	probable	likely
A	Aliabad				✓	
B	Baghestan				✓	
C	Capileira					✓
D	Denpasar					✓
H	Hasanabad				✓	
I	Ibadan				✓	
K	Kireyka				✓	
M	Marrakech				✓	
N	Anegondi					✓
P	Pobia					✓
R	Karapinar					✓
T	Ban Touei					✓
W	Willow Lake					✓
X	Xculoc				✓	

There is a heavy bias in the sample towards communities which practise the joint residential pattern. However, in none of them is it customary for daughters, rather than sons, to remain in their natal co-residential groups after marriage. In addition, in the sample there is a near-absence of communities characterised by the stem residential pattern. These two omissions probably result from the non-random nature of the sample, though it is possible the sample also reflects the true distribution of these patterns in the modern world.[16]

Since only one of the sampled communities is characterised by the stem residential pattern, there are severe limits on the questions which may be asked about communities of this type. By necessity, discussions about residential patterns in the chapters that follow tend to focus on the nuclear and joint residential patterns.

[16] Societies in which daughters retain membership of their natal co-residential group after marriage may be rare across the world, to judge from Goldschmidt and Kunkel's cross-cultural investigation (1971) which found that 'matrilocal joint families' were uncommon among agricultural societies. The rarity of the stem residential pattern in the modern world is indicated by the fact that Murdock (1957) found 'stem families' in only 21 societies out of the 565 in his standardised 'World Ethnographic Sample' (Chu 1969: 311). However Murdock's criteria for identifying 'stem family societies' are different to the criteria used in the present research for identifying the stem residential pattern.

CHAPTER 5
Understanding residential decisions

5.1 Introduction

The conclusion to Chapter 3 proposed that one way in which we can develop our understanding of how co-residential groups form and why they gain or lose members, is by looking at residential decision-making in particular settings. This chapter presents a close-up view of three of the communities from the ethnographic sample and explores the residential decisions of their inhabitants. Each setting provides a rich and complex data set from which we can tease out the factors most likely to have influenced the inhabitants' decisions concerning their living arrangements.

Hasanabad, Aliabad and Baghestan are all small-scale farming and herding communities in Iran.[17] The greatest advantage of using these three communities as case studies is that in each setting the entire population of co-residential groups and the community's entire housing stock have been surveyed, yielding demographic and architectural data that relates to the whole community. The combination of demographic and architectural data enables us to explore how spatial considerations affect residential decisions. This sets the present investigation apart from studies normally undertaken by family historians and anthropologists.

While the focus of Chapter 5 is on determining how spatial considerations impact on living arrangements, the broader aim of the investigation that follows is to build on the basic understandings we have gained from the literature of anthropology and family history. The subsistence economies of the Hasanabadi, Aliabadi and Baghestani communities might prompt us to assume that concerns about economic activities (e.g. efficiencies in labour and consumption), of the types that traditional anthropologists tend to be interested in, would be key to the inhabitants' residential decisions, while the types of macro-scale factors family historians tend to focus on would be largely irrelevant to the three settings. The investigation below, however, suggests that such stereotypes are not useful. Despite being farmers and herders, micro-economic considerations are not paramount to inhabitants of communities such as these; and in spite of the lack of highly developed public institutions and job and housing markets, we should not be dismissive of the impact of the broader social and economic environment on people's choice of living arrangements.

[17] For a description of each community and the inhabitants' way of life, see Appendix A. Plans of the three settlements appear in Appendix B. Further information about the co-residential groups in the three communities, and the residences they occupy, can be found in Appendices E and C, respectively.

Section 5.2 uses the first case study (Hasanabad) to explore the extent to which residential decisions are based on a concern for labour efficiency and economies of scale. Alternative factors are identified as influences on residential decisions: namely, social friction between co-residents and a space-related factor, the availability of spare rooms in peopleôs residences. The second case study in section 5.3 (Aliabad) helps identify another space-related issue that can sometimes have a bearing on residential decisions: overcrowding and the unavailability of sleeping accommodation within peopleôs residences. Finally, the third case study in section 5.4 (Baghestan) helps bring out two further perspectives on the role of space in residential decision-making: space as an opportunity, which can bring about new co-residential group formations, and space as an entitlement, which can reinforce existing patterns of residential decision-making. The chapter ends by reflecting on how these findings fit in with the insights from the literature of anthropology and family history regarding the formation and demographic composition of co-residential groups.

5.2 Case Study 1: Hasanabad

Hasanabad is a Kurdish community of 207 people in the Zagros mountains of western Iran (Watson 1979). The inhabitants occupy 35 residences and practise a joint residential pattern: sons are socialised to remain in their parental residence when they marry and to introduce their brides, whereas daughters and sisters are expected to give up membership of their natal co-residential groups (see Appendix F). There are, however, a few living arrangements which are at odds with this practice: several cases where brothers have subdivided their parental residence and have ended up living apart[18]; two cases where co-residential groups include the families of lodgers (H1009, H1035); one where a couple and their children share a residence with the husbandôs maternal uncle and his wife (H1025); and another where a pair of married sisters and their families co-reside (H1034).

In a setting such as this, where the population relies on a combination of farming and the rearing of livestock for their subsistence, we might imagine that economic considerations ï such as how best to organise labour, and achieve economies of scale ï would be foremost when making residential decisions (cf. Nimkoff and Middleton 1960; Pasternak et al. 1976:117ff.; Netting 1993). The discussion below explores whether this is the case. It then goes on to tease out other factors that may have given rise to the living arrangements recorded by the ethnographer, and identifies two: social friction between co-residents, and the availability of spare rooms in several residences.

[18] This includes the brothers in H1003, H1037 and H1039; and the brothers in H1018, H1027, H1034 and H1036.

5.2.1 Efficient labour organisation and economies of scale

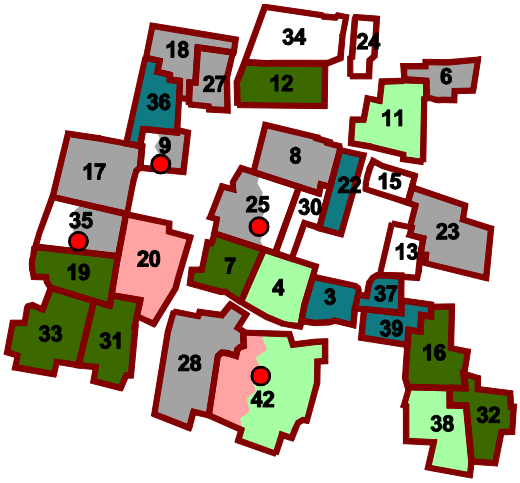
There can be no doubt that economic considerations played a part in some of the inhabitantsô residential decisions: most obviously the decision by several young men to leave their natal co-residential groups and permanently emigrate to cities or near-by settlements in search of jobs and better living conditions.[19] What is less clear is whether people who decided to live together did so in the interests of labour organisation and economies of scale.

Fortunately, we have information at our disposal that can help us explore this. The inhabitants of Hasanabad co-operate in various ways for their subsistence, and form a variety of task-groups. The memberships of those task groups have been recorded by the ethnographer (Watson 1979: Tables 2.7, 4.2, 4.3, 4.5 and 5.6); here, the spatial distribution of the members of each grouping has been mapped (Figures 5.1 to 5.4). The maps reveal a disjunction between co-residential group membership and task group membership, which calls into question the notion that concerns about productive efficiency and economies of scale take precedence over other considerations.

First, it is important to point out that despite their status as sharecroppers the inhabitants of this community are free in the choices they make regarding their residential and economic arrangements. Each farmer in Hasanabad has sharecropping obligations to one of five absentee landlords, but there is no reason to think that these landlords force people to live and work together. Figure 5.1 shows which landlord the members of each co-residential group work for. There are several examples of co-residential groups where some adult male members work for a particular landlord while the rest do not (H1009, H1025, and H1035). In the case of H1042, three brothers who live together in the same residence work for two different landlords, retaining separate debts and storing their agricultural produce separately within their shared residence. This demonstrates that landlords in Hasanabad, unlike those in the communities referred to in Chapter 3 (section 3.4.2), apply little or no pressure on people who co-reside to act as single labour units or units of consumption. If co-residents co-operate, it is because they choose to for their own interests.

[19] This is the case with the brother of the head of H1009, H1038, and H1031, and the son of the head of H1007.

FIGURE 5.1 Distribution of sharecroppers in Hasanabad



Each colour indicates a different landlord
In blank residences, no residents are involved in sharecropping
Residences in which only some residents work for a landlord, or where residents have sharecropping obligations to different landlords indicated with ●

In the absence of external pressure, do members of co-residential groups opt for the órationalô decision of co-operating economically with one another? When it comes to one of the most essential economic activities in this community, herding, it is clear that this is not always the case. In Hasanabad, it is common for groups of men from various parts of the community to pool together their flocks of sheep and goats, and for the members of each herding co-operative to take it in turn to lead the communal flocks to grazing land. Figure 5.2(a) shows where men who co-operate in this way reside. The map reveals one instance where brothers who live together as part of the same co-residential group belong to three different herding co-operatives (H1042), and several more cases where men refuse to treat their flocks as common property with the rest of their co-residential group (H1018; H1025; H1031; and H1034). A similar situation applies to the herding of kids and lambs, a task undertaken by young boys. Figure 5.2(b) shows instances where men who live together commission a different boy to take their kids and lambs out to graze (H1042 and H1028), and several more where flocks of kids and lambs are not considered to be the communal property of the co-residential group (H1009, H1018, H1025 and H1031).

All these cases demonstrate that co-residential groups sometimes consist of discrete economic units that operate independently of one another and own property separately. Yet, in these cases, people still chose to co-reside despite their separate economic interests. Thus,

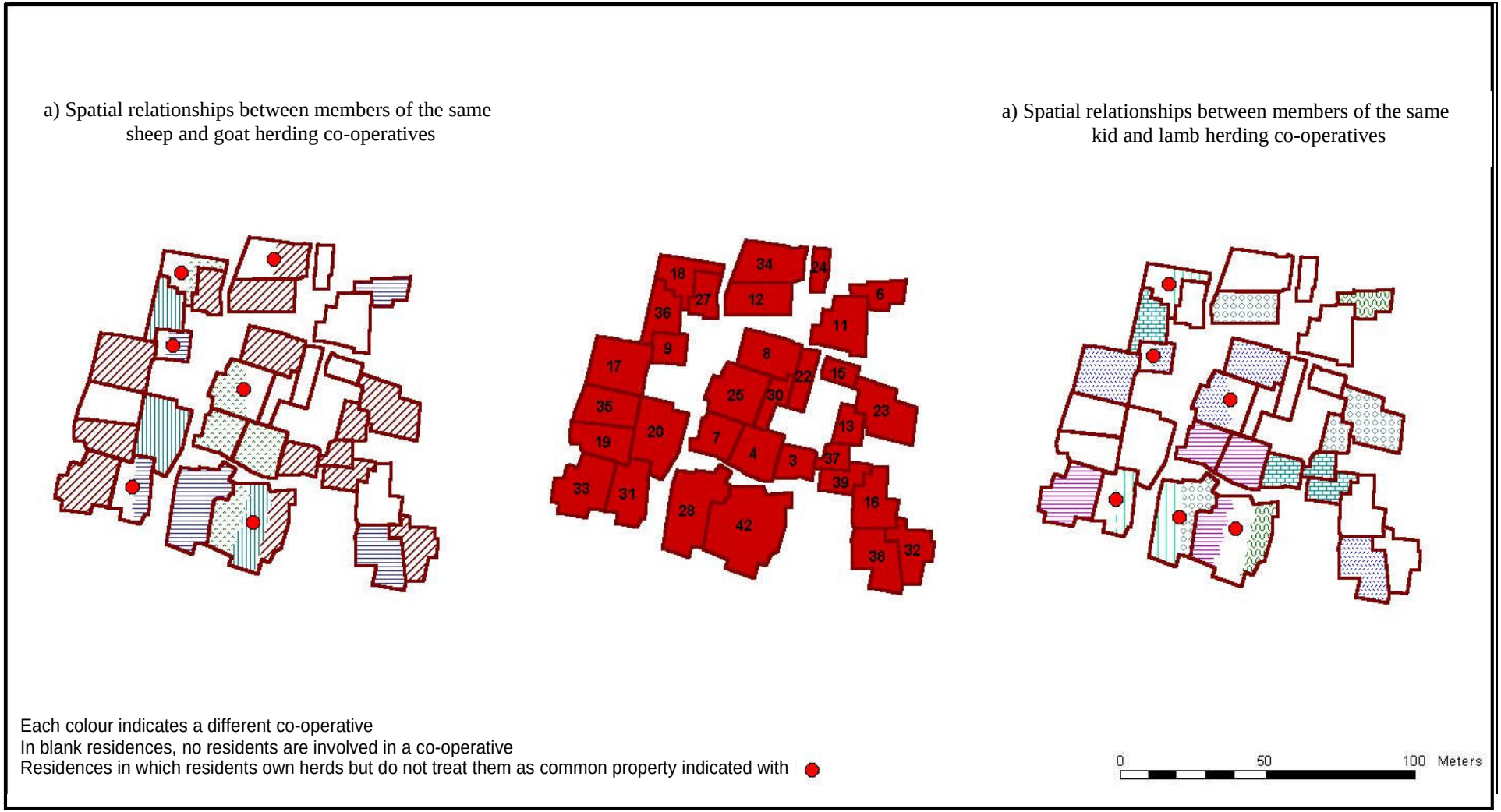


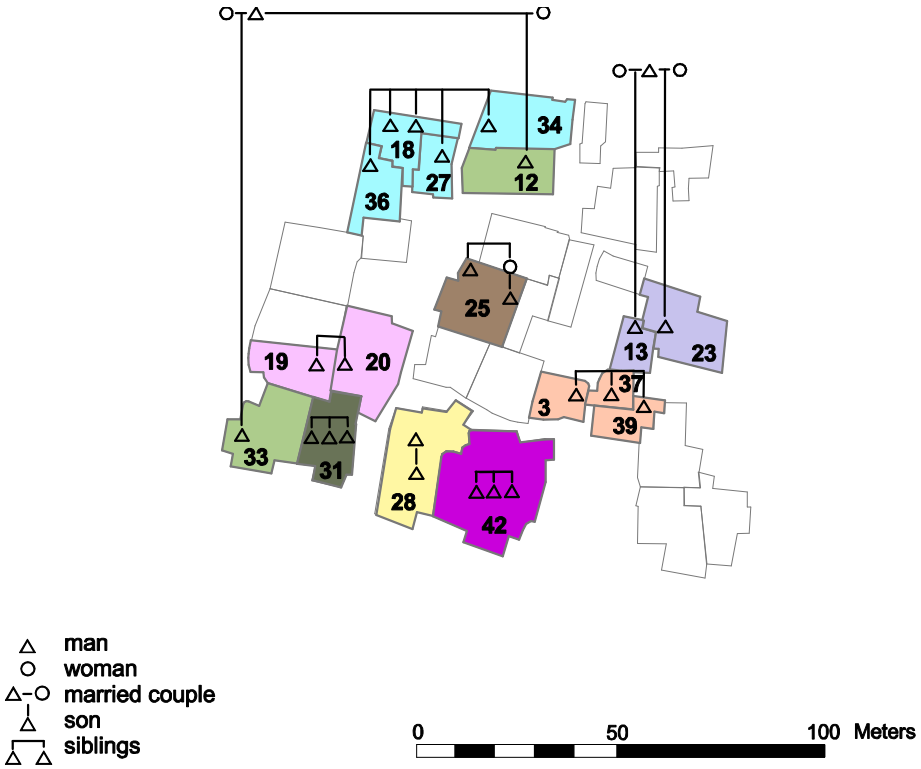
FIGURE 5.2 Distribution of a) men who pool together their sheep and goats and share herding responsibilities, and b) kid and lamb herds which are put under the charge of the same boy in Hasanabad.

it would be wrong to say that economic considerations were necessarily foremost in peopleôs minds when making residential decisions.

To make sense of this situation, it is important to remember that people may not actively come together to form co-residential groups but may find themselves co-residing by default, because they happened to be born into the same natal co-residential group.

Figure 5.3 shows where closely-related men reside. The co-residence of several sets of adult brothers (H1018, H1031 and H1042) and of a father with his married son (H1028) suggests it is likely that many of the living arrangements in Hasanabad came about in this way. By custom, men are expected to retain membership of their natal co-residential groups for life and bring their wives into these groups. It appears that many did so even when they were not prepared to co-operate or share their property with their co-resident fathers or brothers.

FIGURE 5.3 Distribution of closely-related men in Hasanabad



5.2.2 Social friction

Since men in Hasanabad have the right to remain in their parental residences indefinitely, it would seem easier for sets of brothers to retain a co-residential arrangement with their brothers than to take steps to dissolve their natal co-residential groups. Yet Figure 5.3 shows instances where brothers have chosen to break up their natal group by subdividing their

parental residence or moving into another residence close-by. What might have prompted these residential decisions?

Social friction is commonly thought to be symptomatic of multi-conjugal occupancy, particularly amongst co-resident married women (cf. Verdon 1998: 57-63; Rosenfeld 1958). Theoretically, this could explain why two pairs of half-brothers in Hasanabad live apart (in H1012 and H1013, and in H1033 and H1023), but it may also explain other living arrangements in the community.

The existence of social tension in Hasanabad can be inferred from the data we have about two more types of task-group. Figure 5.4a shows where women who work together in milking co-operatives reside; and Figure 5.4b shows where men who co-operate in fish-trapping co-operatives reside. These two types of task-group differ from herding co-operatives, because people choose to milk together or fish together on the basis of mutual affection and companionship, rather than practical or economically órationalô considerations (Watson 1979: 231). This becomes clear when comparing the membership of these two co-operatives with the membership of sheep-and-goat-herding co-operatives (Figure 5.2a). It is clear that women do not choose to milk their animals together just because their husbands co-operate in herding them. Similarly, it is rare for men who participate in the same sheep-and-goat-herding co-operative to also choose to fish together. Thus, milking and fishing co-operatives can tell us a little about friendships and socialising in Hasanabad.

Two points are of particular interest. First, women never choose to co-operate in milking activities if their husbands are brothers: sisters-in-law avoid each other. This is apparent by comparing the memberships of milking co-operatives (Figure 5.4a) with the kinship relationships shown in Figure 5.3.[20] If this pattern of avoidance is indicative of antipathy, and this is typical of relations between sisters-in-law in the community, then we can expect any multi-conjugal co-residential arrangement which consists of married brothers and their families of procreation to potentially be fraught with social tension.[21]

Second is the telling case of the brothers in residences H1018, H1027, and H1036, who singled out their eldest brother (in H1018) for exclusion from fish-trapping co-operative óxxxô, despite the inclusion of his co-resident younger sibling (Figure 5.4b). This may be a sign of discord between him and his brothers. As the eldest amongst them, he would have

[20] The only apparent exception to this involves H1013 and H1023: this, however, is not a case of co-operation between sisters-in-law, but between a woman (in the former) and her daughter-in-law (in the latter).

[21] Interestingly, women do not necessarily share tasks with their own kinfolk either. Of the eight milking co-operatives, none contain sisters, and only one ('3') consists of mothers and daughters.

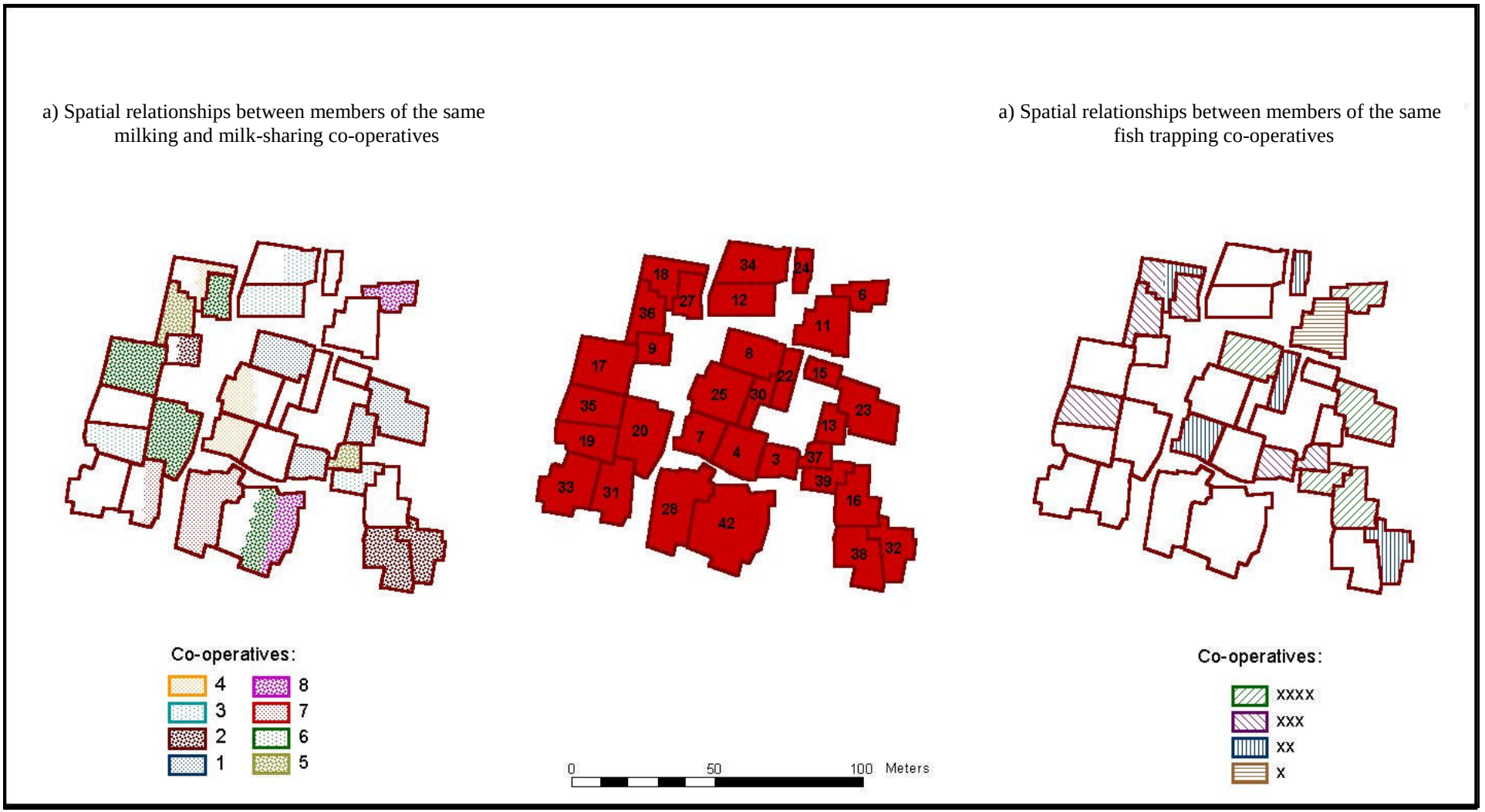


FIGURE 5.4 Distribution of a) women who share milk and milk-related tasks, and b) men who co-operate in fishing activities in Hasanabad.

inherited most of their parentsô property (Watson 1979: 213) as well as headship of the natal co-residential group upon their fatherôs death, both of which may have caused resentment amongst his brothers. Likewise, amongst the brothers who head H1003, H1037, and H1039, one man (the youngest sibling, this time) does not co-operate with the others in fishing, perhaps again because there is a degree of antipathy between the brothers.

The above suggests that social tensions sometimes exist between people who used to co-reside but no longer do. Trivial though it seems, friction may have had very tangible effects on living arrangements. Friction between brothers could be the root cause of the subdivision of the two parental residences H1018/H1027/H1036 and H1037/H1039, but underlying tensions between co-residing sisters-in-law may have acted as a catalyst for the dissolution of the two natal co-residential groups that occupied them (cf. Verdon 1998: 57-63, Rosenfeld 1958: 1136).

The broader economic environment may also have played a role. The break-up of these natal co-residential groups occurred during a period of economic crisis in the community brought on by successive crop failures. The ethnographer notes that years of surviving at the edge of starvation fostered a climate of secrecy, mutual suspicion, and insecurity in Hasanabad during her period of observation, which aggravated ordinary background levels of friction amongst community members (Watson 1979: 227f.). Perhaps these broader circumstances made co-residential groups particularly susceptible to breaking up.

5.2.3 The availability of spare rooms

The prevailing economic conditions in Hasanabad can also help us make sense of the residential decisions that led to the unusual compositions of four more co-residential groups (H1009, H1025, H1034, and H1035). Due to successive poor harvests over recent years, the community saw an increase in the rate of emigration of individuals and families (Watson 1977: 227). Emigration, together with the fact that most men are in any case fatherless by the time they marry (ibid. 224),[22] means that two thirds (66%) of co-residential group heads have no close male married relatives in the community with whom to co-reside. As a consequence, 14 heads were unable to fill all the sleeping accommodation in their residences with relatives, and had spare capacity.

[22] Menôs average age at marriage in Hasanabad is not recorded, but the average age at which they have their first child is 29.1 (n=29), suggesting that they tend to marry in their late twenties. Hasanabadi men have a life expectancy of fifty-seven years. Hence, the chances are that fathers will not live long enough to see all of their sons marry.

The surplus space provided these co-residential group heads with opportunities. Two of the heads took the opportunity to earn extra cash by offering sleeping accommodation to the families of gendarmes stationed in the settlement (H1009, H1035).[23] Another head (H1025) offered a spare room to his nephewôs family, although possibly not for remuneration but because he is in his forties, still childless, and wishes to have heirs.[24] This same head has also allowed his widowed mother-in-law to co-reside with him, so it is likely that a concern for his relativesô well-being may have influenced his residential decisions. Finally, the two men in H1034 were taken in by their father-in-law, possibly out of concern for the well-being of his daughters, after the men found themselves effectively homeless.[25]

These decisions could be put down to a combination of factors: emigration rates in the community, a concern for minimising the nuclear hardship suffered by relatives (cf. section 3.4.4), and, in some cases, plain financial savvy. Ultimately, though, the resulting living arrangements would not have been possible ï indeed, may not even have been contemplated ï if it had not been for the availability of spare rooms in a handful of residences.

Some of the themes we have seen in Hasanabad also emerge in the close-up examination of another Kurdish community, Aliabad. In the case of Aliabad, however, it could be argued that it was the *lack* of space in residences which lay behind certain residential decisions.

5.3 Case study 2: Aliabad

Aliabad is a slightly larger Kurdish community in central western Iran, consisting of 418 people (Kramer 1982). Its inhabitants are distributed across 67 residences, and they, too, practise a joint residential pattern (see Appendix F). However, while married sons initially take advantage of their right to bring their wives to their parental residence,[26] it is common for natal co-residential groups to eventually lose some of their male members and experience some degree of dissolution in their memberships.[27]

[23] After Watsonôs main period of fieldwork, two other co-residential groups (H1011, H1017) also took on gendarme lodgers (Watson 1979: 40).
[24] The headôs nephew is in fact older than him (forty-five years old), but has children and may have more in the future who may inherit from his uncle.
[25] One man is an immigrant, and the other is one of the brothers in the H1018-H1027-H1036 set who was forced out due to constraints on space in his parental residence (see more about constraints on space in section 5.3.1).
[26] Every one of the 12 men in the settlement whose parents are alive, and who married relatively recently, resides in his parental residence.
[27] The dissolution of groups tends to be delayed until after the head has died. This is indicated by the fact that only ten of the 26 married men whose fathers are alive (38%) have departed from their natal co-residential group; by contrast, 16 of the 18 sets of married brothers whose fathers are deceased (89%) have broken up their natal co-residential groups.

Most of the men who departed from their natal co-residential group are eldest sons.[28] Eldest sons are not automatically shed from their natal co-residential group at the time of their wedding, however.[29] Instead, an eldest son is likely to retain membership while his younger brothers are unmarried,[30] and leave the group in the company of his wife and children as soon as one of his younger brothers brings his bride to the parental residence.[31]

The tendency by eldest sons to give up membership of their natal co-residential group is peculiar given the budgeting arrangements of co-residential groups in Aliabad. Co-residents in this community, unlike Hasanabad, pool together their income and their agricultural produce and keep a common budget (Kramer 1982: 21). The departure of two adult members, the eldest son and his wife, would therefore have economic repercussions for the entire group, and would not be undertaken lightly.

The discussion that follows explores why some men choose to quit their parental residence, and identifies spatial constraints as a possible explanation. Loss aversion, the anticipation of conflict between co-residents, and the anticipation of overcrowding, may explain the departure of other men, and also makes sense of the decision by some co-residential groups to break up into smaller groups by subdividing their residences.

5.3.1 The unavailability of rooms

The ethnographer proposed that co-residential groups who perceive that their residence has become overcrowded tend to break up (Kramer 1982: 21), so overcrowding may explain why eldest sons leave their parental residence. As we will see, several strands of evidence support this.

Young people in Aliabad are socialised to expect that when they marry they will find accommodation within the groomôs parental residence (Kramer 1982: 21). More specifically, couples expect to be given their own private sleeping accommodation (ibid. 104, 117). In

[28] There are ten married men whose fathers are recorded as being alive and resident in Aliabad, but who nevertheless have opted to reside independently. Eight of these are the eldest amongst their siblings. These are the heads of: A103a, A1012, A1019, A1020, A1025, A1046, A1073, and Al074. In addition, in two of the four co-residential groups in Aliabad where some married brothers have remained co-resident after the death of their father (A1022, A1050), the eldest married brother in each set of siblings does not participate in the arrangement but resides independently elsewhere.

[29] Twelve married eldest sons still live in their parental residence (A1001, A1011, A1017, A1023, A1026, A1029, A1031, A1037, A1044, A1048, A1054 and A1065).

[30] Ten of the 12 married eldest sons who have retained membership of their natal groups do not yet have any married younger brothers.

[31] Six of the eight married eldest sons who have left their natal co-residential groups have at least one younger brother who is married. These eldest sons reside in: A103a, A1012, A1019, A1025, A1073, and A1074.

most cases this expectation is fulfilled: out of the 83 married couples in Aliabad, there are only five who do not sleep in a private room specifically designed for that purpose, and these cases can be explained as the result of temporary or unusual circumstances.[32] Thus, we would expect that the successive marriages of the headôs sons would result in the progressive saturation of available space within the residenceôs boundaries.

Indeed, in almost every case where a son left his natal co-residential group, the parental residence was short of sleeping accommodation.[33] Except in two cases, the departure of one son and his spouse from each of these residences was all that was needed to ease the pressure on spatial requirements and accommodate the remainder of the couples comfortably. Co-residential groups A1079 and A1050 at some point must have contained two or more conjugal couples who could not be fitted in, which may explain why, in each case, two men had to depart from the parental residence resulting in a three-way split (A1079-A1075-A1039, and A1050-A1053-A1006 respectively).

If residences were short of sleeping accommodation, one might ask why the alternative option of expanding a residence was not preferred to the shedding of eldest sons. A possible answer is that extension was simply not a realistic option for the majority of residences. Most already possess an upper storey and are therefore already taking advantage of all available space.[34] The potential for converting existing rooms with other functions into sleeping accommodation is not known.

The unavailability of rooms may therefore lie behind some of the residential decision-making of eldest sons. This, however, cannot be held responsible for every case in which men have left their natal co-residential group; nor can it explain why it is the eldest sons rather than the newly married younger sons who break off membership of their natal groups. Moreover, a

[32] Two of the five couples are newlyweds (either childless or with one infant child) who sleep in kitchens (A1018, A1065). Another newlywed couple shares a room with the groomôs parents (A1048). A fourth couple (A1001) surrendered their private sleeping accommodation to the husbandôs newly married younger brother and moved into the kitchen, presumably tolerating this arrangement because it only obtains for the short intervals between the husbandôs seasonal migratory trips (Kramer 1982: 119, Footnote 13). The fifth couple (A1050) consists of the headôs married sister and husband, who were presumably taken in by the head under unusual circumstances, and who sleep in a room that is not entirely private.

[33] Eight parental residences do not have sufficient sleeping accommodation to accommodate every married couple entitled to space. The parental residences in question (followed in brackets by the co-residential groups that formed as a result of men leaving the residence) are: A1003 (A1003a), A1050 (A1006 and A1053), A1008 (A1010), A1015 (A1014 and A1019), A1022 (A1062), A1048/A1049 (A1082), A1077 (A1073), and A1079 (A1075 and A1039).

[34] Seven of the eight parental residences which did not have sufficient sleeping accommodation already have an upper storey (A1003, A1050, A1008, A1015, A1022, A1048/A1049, and A1077). In the eighth case (A1079), it is not clear why the spacious courtyard was not used to construct the extra sleeping accommodation required; perhaps the availability of an empty neighbouring residence (A1075) made extension unnecessary.

lack of space in the parental residence cannot explain why parental residences were subdivided, since subdivision would not have resulted in the addition of further sleeping rooms.

5.3.2 Anticipating conflict, economic loss, or overcrowding

We have already seen from Hasanabad that relationships between members of multi-conjugal co-residential groups may be strained. In his study of a Palestinian community, Rosenfeld suggested that tensions may be heightened when a co-residential groupôs communal fund is at risk of being drained by dependent half-brothers, or by nephews seeking to pay their bride-price (Rosenfeld 1958: 1133f.). Data from Aliabad backs this up, and helps us make sense of all the remaining instances where a son has left his natal co-residential group, or where brothers have subdivided their parental residence.

First, there are three cases where a son quit his natal co-residential group after his father remarried and had children with his new wife.[35] In only one case has a son not quit his natal group despite the presence of half-siblings (A1065): perhaps his tolerance of his half-siblings can be explained by the fact that they are all girls destined to eventually leave the residence upon their marriage. In none of the cases where the son departed did the parental residence lack sufficient sleeping accommodation. The sonôs departure may therefore have been prompted by tensions between him and his juvenile half-siblings, and the undesirable prospect of having to invest his own and his wifeôs labour and income towards their maintenance. Indeed, we could extrapolate from this a possible reason why the man most likely to quit a natal co-residential group is the eldest amongst his siblings: his departure may be prompted by the wish to avoid subsidising the newly born children of his newly married younger brother.

Second, there are four instances in Aliabad where a set of brothers subdivided their parental residence: in three of those cases there was a married nephew between each set of brothers,[36] and in the last case there was a nephew of marriageable age between them.[37] By contrast, in situations where they are no nephews of marriageable age, married brothers have continued to co-reside.[38] In all these cases, the approach of the nephewôs wedding offers a plausible explanation for why the brothers chose to establish separate co-residential groups, splitting their common budget before it could be depleted by their nephew.

[35] The three newly established co-residential groups are: A1020, A1025, and A1074. The first of the three was created by subdividing the parental residence.
[36] A married nephew exists amongst the brothers who head: A1048-A1049; A1054-A1057; and A1015-A1047.
[37] A nephew of marriageable age exists amongst the brothers who head A1058 and A1059.
[38] This is true of co-residential groups: A1001, A1022, A1050, A1054, A1075 and A1079.

Based on the above, residents may sometimes break up their living arrangements in anticipation of conflict or personal financial loss. This is an apt reminder that self-interest is inherent to residential decision-making, as implied by both the micro-economic and processual explanatory models presented in Chapter 3 (see section 3.2.3).

It is worth considering the possibility that break-ups can also occur in anticipation of overcrowding in the parental residence (cf. Rosenfeld 1958: 1135). This may account for the one remaining unexplained case of a departure of a son from his parental residence (A1047), despite the existence of sufficient sleeping accommodation for his wife and children.[39] Conversely, co-residential groups which anticipate their future spatial requirements may choose to expand the capacity of their residences ahead of spatial saturation,[40] suggesting that break-ups can sometimes be averted.

So far, we have been viewing space as a requirement which prompts or influences residential decisions through its over-supply (as in Hasanabad) or under-supply (as in Aliabad). This view of space fits comfortably within the micro-economic model which explains living arrangements as the result of the demand and supply of ógoodsô, including ógoodsô that require space. In the final case-study, we can start to look at the role of space from a different perspective: not as a requirement but as an opportunity, which can bring about new co-residential group formations, or as an entitlement, which can reinforce existing patterns of residential decision-making.

5.4 Case Study 3: Baghestan

Baghestan is a Persian community in the Khar o Tauran plain, situated in the Semnan province of north-east Iran (Horne 1994). Its 29 residences accommodate a population of 154 people. Although its inhabitants rely on broadly similar subsistence strategies to those of Hasanabad and Aliabad, the Persian inhabitants of Baghestan have been socialised quite

[39] The head of A1047 has two more sons, and may have decided to use his co-residential groupôs extraordinary wealth (they are the second most wealthy co-residential group in the community: Kramer 1982: Table 3.7) to finance the construction of a new residence close-by for his son before overcrowding became a problem.

[40] For example, the head of A1083 purchased a residence with more sleeping accommodation than is currently required by the members of his group (Kramer 1982: 119), while the head of A1063, despite not currently needing extra rooms, expanded his residence shortly after Kramerôs fieldwork was completed by taking over A1062 upon its abandonment (ibid. 61).

differently to the Kurdish inhabitants of the two other communities.[41] Younger generations in Baghestan do not expect to remain in their parental residences after marriage (ibid. 170), and betrothed couples are sometimes forced to delay their weddings until independent residences can be constructed, purchased, or inherited for their use (ibid. 185). Altogether, the evidence from this community points to the practice of a nuclear residential pattern (see Appendix F).

If economies of scale had been a primary consideration in Baghestan, it would be commonplace for married couples to try and minimise their expenses by co-residing with the parents of either the husband or wife. The spacious compounds of their parents would certainly have allowed for the addition of extra sleeping accommodation, but, in the event, no married child occupies a parental residence together with his or her parents and spouse. This is a clear testament to the influence of socialisation in shaping peopleôs expectations regarding óappropriateô living arrangements.[42]

While residential decisions in Baghestan are guided by socialisation, they may also be motivated by other considerations. Concern for the well-being of vulnerable relatives is apparent in the composition of several co-residential groups. In five cases, an elderly widowed, separated, or unmarried person was taken in by a younger relative.[43] There are two cases where a child was óloaned outô to his or her grandparents (B1020 and B1027), presumably to provide companionship and help with domestic chores (Horne 1994: 159). Finally, there is one situation where the residence of a widow and her children was amalgamated with the neighbouring residence of her brother-in-law (creating B1004). The courtyard wall that binds the two residences together was almost certainly set up after the

[41] It could be argued that the notions prevalent in Baghestan originated in connection with certain idiosyncrasies in its inhabitants' economic and subsistence strategies. However, it should be pointed out that this explanation has a strongly functionalist flavour. The origins of the notions that Baghestanis, Hasanabadis and Aliabadis hold (and of the particular residential patterns they practise) cannot be confirmed without reference to the histories of these communities. It is beyond the scope of this thesis to speculate further on why the inhabitants of the three communities are inculcated with different notions and expectations.

[42] In Talebabad, another Persian settlement in Iranôs Semnan province, this is expressed even more clearly through the practice of natolocality, whereby a wife continues to occupy her parental residence after marriage, and a husband his, until the couple is able to acquire its own marital residence and set up a new co-residential group (Connell 1969: 90)

[43] The following co-residential groups have taken in widowed, separated or unmarried adults, who are almost certainly in their sixties or seventies: B1007 (the father of the 40-year-old head); B1015 (the mother of the head; the headôs age is unknown, but the headôs elder brother is in his forties so their mother must be elderly); B1028 (the mother of the 40-year-old head); B1026 (the mother of the headôs wife; the age of the headôs wife is unknown, but her elder brother is in his forties so their mother must be elderly); B1009 (the aunt of the 50-year-old head).

woman was widowed,[44] possibly as a means of protecting her, but also as an expedient way to provide communal shelter for their flocks and agricultural produce.[45]

The discussion that follows focuses on the one extraordinary co-residential group in the community. B1003 consists of three unrelated couples and their children. By trying to understand the residential decisions that led to its formation, we can begin to reflect on how spatial circumstances can give rise to co-residential groups with new and unusual demographic compositions, while, for the most part, helping to sustain and reproduce traditional living arrangements.

5.4.1 Space as an opportunity

Co-residential group B1003 occupies the *Q'ala*, an unusually large building erected at a time when insecurity in the region necessitated large defensive dwellings (Horne 1994: 83). This residence has a 'ground-plan area' of 610m^2, making it more than 200m^2 larger than the next largest residence in Baghestan. From the outset it is clear that the co-residential arrangement in B1003 did not come about through the practice of a joint residential pattern, in which adult sons or daughters retain membership of their natal co-residential group. This is evidenced by the fact that the six adult residents are not related to each other; five of them are not even related to the previous owners of the building.[46] Instead, multi-conjugal occupancy would seem to have come about through the appropriation of rooms within the *Q'ala*.

The personal circumstances of the three couples in question may explain why they chose to do this. The couples are amongst the poorest in the community,[47] and would have had limited funds with which to set up their marital homes. Moreover, none of the three husbands have any consanguineous relatives living locally, suggesting that the men probably immigrated into Baghestan and so had no prospect of inheriting a residence or any rooms within the settlement. In view of this, each couple would have found the purchase of an existing set of rooms in the *Q'ala* preferable to either of its alternatives: investing in the purchase of a plot and construction of a new residence, or postponing their wedding until the bride inherited rooms from her relatives.

[44] The ethnographer witnessed the surviving brother adding the gate to the courtyard, and mentions that the courtyard wall itself had been the next to last addition (Horne 1994: 149). The wall that binds together the individual properties of the two brothers therefore could not be more than a few years old.
[45] The two brothers used to co-operate closely in subsistence activities (Horne 1994: 110f.). There are two other pairs of brothers in the community who co-operate closely (the heads of B1015 and B1019, and the heads of B1012 and B1016), but they use communal animal houses, goat pens, and straw storage rooms to store their flocks and produce (ibid. Figure A-2), instead of a shared courtyard.
[46] The inhabitants of Baghestan maintain their surnames after marriage, but only one adult resident of B1003 shares the surname of the previous owners of the building (Horne 1994: 112-3).
[47] Their wealth is ranked 18th, 26th, and 27th, respectively, out of the 31 economically independent nuclear families or individuals in the community.

Co-residential group B1003 therefore very likely came about inadvertently, as a result of three separate decisions to act resourcefully by taking over empty rooms in a ready-made residence. This is the type of residential decision we would expect to see in many immigration scenarios, resulting in a variety of unusual and expedient configurations of residents.

The case of B1003 illustrates how the availability of space can influence residential decisions, or even inspire them, giving rise to living arrangements that might not otherwise have been contemplated. But the case of B1003 is also a case of dispossession: it illustrates the kinds of opportunities people seek out when they have no guarantee of a place to live. As such, it can serve as a starting point for considering why inheritance systems complement particular residential patterns (cf. section 3.4.3).

5.4.2 Space as an entitlement

Inheritance systems are amongst the factors that family historians and anthropologists have associated with different residential patterns. Arguably, the prospect of inheriting (or not inheriting) space in a parental residence can have a particularly strong influence on residential decisions. The case of Baghestan, when placed side by side with the two other communities, can help illustrate this.

It is customary in Baghestan for equal shares of residential property to be passed down to every one of the headôs offspring, whether male or female (Horne 1994: 188). No child has any special advantage over any other in their right to appropriate their parental residence after their parents have died. As neither sons nor daughters are able to securely claim any rooms in the parental residence as their own, all children are obliged to find a new place to live. This complements any cultural predisposition they may have to leave their natal co-residential group upon their marriage, and contributes to sustaining the practice of a nuclear residential pattern.

By contrast, other communities treat either sons or daughters preferentially with regard to the transfer of residential property. In Aliabad and Hasanabad, men ï who are the future heirs to the parental residence ï anticipate that private sleeping accommodation will be made available to them but not to their female siblings once they are married. This reinforces the expectation in women that they must relinquish membership of their natal co-residential groups, and thus helps maintain the practice of a joint residential pattern. In yet other communities, residential property is promised to only one child, and it is with the prospect of eventual dispossession from the parental residence (i.e. unavailability of space) that siblings

leave their natal group when they marry, in this way maintaining the practice of a stem residential pattern.

By entitling some individuals (and not others) to space in their parental residence, inheritance systems play a significant role in shaping a community's living arrangements. The guarantee of habitable space reinforces certain patterns of residential decision-making, and so helps sustain the residential pattern practised by the inhabitants of a community.

5.5 Conclusion

The first of the three key objectives of this research has been to explain how co-residential groups form in different cultural contexts, how and why they change their composition, and what role space plays in this. The literature of anthropology and family history has helped us recognise some of the basic factors contributing to the demographic make-up of co-residential groups, but had little to say regarding the ways in which space impacts on residential decisions and living arrangements. Chapter 5 has therefore sought this information from the ethnographic record.

The three case studies in Chapter 5 were used to draw attention to several factors that anthropologists and family historians tend to undervalue, including the spatial circumstances that people experience when making their residential decisions. The availability of surplus space and the unavailability of sleeping accommodation *within* residences are arguably just as important in swaying residential decisions as housing availability (discussed in section 3.4.4), yet these barely get a mention in the literature.

On the basis of the case studies, the suggestion was also made that socialisation, inheritance systems, and the entitlement to space in parental residences can work together to sustain a communityôs residential pattern. That is not to say that residential decisions are in any way automatic, or that people stick slavishly to tradition. While the tendency is there to reproduce traditional living arrangements, people can and often do act expediently with their own interests in mind: taking in lodgers, breaking up their natal co-residential groups, or moving in with strangers to form new and unexpected configurations of residents.

The most important point to emerge from these case studies is how significant spatial circumstances can be in understanding residential decisions. Without an appreciation of the spatial circumstances in which particular groups find themselves, it would be difficult to make sense of some of the living arrangements in the three communities, or more generally in the world around us. The occasional emergence of multiple-conjugal arrangements in

communities which practise a nuclear residential pattern, or instances where natal co-residential groups break up in communities that practise a joint residential pattern might seem inexplicable if one knows nothing about the availability of sleeping accommodation in certain residences. We may therefore call into question attempts by family historians or others to explain the composition of 'households' by relating them to demographic, socio-economic and political conditions, whilst making little or no reference to the residences which accommodated those groups.

Hence, the conclusion to the first of the major objectives of this thesis is that space does have an impact on the formation and membership of co-residential groups, and that it should be given greater credit for its contribution in this respect. It may not be feasible to tie this and all the other contributing factors that anthropologists and family historians already recognise into one coherent framework that explains why the memberships of co-residential groups vary. Nevertheless, we now have grounds for believing that a relationship exists between co-residential group demographics, on the one hand, and space, on the other. On this basis we can start to look for regularities between the composition of co-residential groups and the spatial attributes of their residences. This is something that Chapter 6 turns to next.

CHAPTER 6
Co-residential groups and the spatial attributes of residences

6.1 Introduction

This chapter explores whether demographic information about co-residential groups can be derived from the spatial attributes of residences. Four spatial attributes are explored: section 6.2 defines them and justifies why they were chosen. Each attribute is then discussed in turn in the sections that follow. The ethnographic sample is used to explore how each of the spatial attributes relates to the population size or structure of co-residential groups, or to residential patterns. The chapter concludes by summarising the findings and learning points from this investigation, and considering which of these can be transferred to other contexts (section 6.7).

6.2 The spatial attributes of residences

Efforts by anthropologists and others to understand the ways in which domestic architecture reflects social organisation have produced a range of insights (Lawrence and Low 1990). Amongst them are glimpses into the nature and degree of ófitô between residential layouts and the composition of co-residential groups. These form the background of the present research, and help to identify which aspects of a residence are expected to vary in relation to co-residential group membership.

Fifty years ago, Jack Goody proposed that an association existed between specific configurations of residents and the layouts of their residences by observing that the homesteads of the LoDagaba contained more rooms and had more extensive perimeters when they accommodated a greater number of wives or married sons of the head (Goody 1971 (originally 1958)). Other ethnographers have since confirmed this relationship, and generated further insight into it (David 1971; Oswald 1987).[48] Their findings suggest that the population size and structural complexity of co-residential groups finds expression in:

a) the number of rooms, and
b) the overall area of the residences they occupy.

With regard to room numbers, David was quick to point out that some rooms or structures in the residence were ñnot directly determined by household compositionò but were ñoptional, with choice controlled by other social and economic factorsò (David 1971: 117). If, as this

[48] The most salient of their insights was that high construction costs and highly durable building materials can prolong the time intervals between episodes of construction or modification, thereby reducing the opportunity to tailor the layout of a residence to the ever-changing composition of its occupants. This suggests that the ófitô between residences and co-residential groups may be less obvious in some contexts than in others.

implies, the number of spaces used for such things as storage or economic activities can sometimes vary for reasons that have nothing to do with the demographics of the co-residential group, a total room count may not reflect composition as closely as a more selective room count.

Cross-cultural investigations into the relationship between residential area and numbers of occupants flourished during the 1970s and 1980s. An early study linking these two variables gave rise to the well-known proposition that residents each use an average of $10m^2$ of roofed residential area (Naroll 1962). Criticism of this figure focused on the fact that it was derived from the logarithmic transformation of an extremely varied raw data set (Wiessner 1974; Whitelaw 2001). This prompted others to try and define the relationship between population and residential space using areal measures that were less sensitive to cross-cultural variation. As with Narollôs measure, all the more refined measures ï such as óroofed living areaô (LeBlanc 1971) or ódwelling sizeô (Kolb 1985), which excluded storage spaces or animal shelters within the residence ï correlated to some degree with population size. Moreover, a regular cross-cultural association was discovered between larger óliving floor areasô and multi-conjugal occupancy (Ember 1973; Divale 1977).[49]

The above suggests that any relationship there may be between co-residential group demographics and the physical forms of residences should be sought through the study of selective rooms counts, on the one hand, and areal measurements, on the other. Four spatial attributes have been chosen here for analysis:

1) *Counts of 'actual sleeping spaces':* Residences, as they are defined in the present research, are first and foremost the residentsô locus for sleeping. Regardless of the number and nature of any other domestic activities that occur within their boundaries, residences ensure the provision of enclosed sleeping accommodation for every one of their regular occupants. Thus the sleeping spaces in a residence, in their total, should hold information about the entire co-residential group.

   This study distinguishes between three types of sleeping accommodation. óActual sleeping spacesô are enclosed spaces used for sleeping by any category of resident (regardless of whether or not the spaces were designed for this purpose). óConjugal roomsô are a subset of this category: they are 'actual sleeping spaces' used by married residents and their spouses, sometimes along with other people (and, again, regardless of whether or not the spaces were designed for this purpose). óFormal sleeping spacesô

[49] However this finding is somewhat undermined by the assumption that multi-conjugal occupancy is a trait exclusive to matrilocal societies.

are all rooms designed as sleeping accommodation for residents or for their guests, some of which were not actually in use for this purpose during the ethnographer's research.

2) *Counts of 'cooking spaces':* Cooking is a common residence-based activity in many societies. For this reason, it is worthwhile exploring whether a count of all enclosed spaces used for primary cooking activities within the residence correlate in any way with the composition of co-residential groups.

3) *'Dwelling area':* This measure combines the floor areas of all enclosed spaces used by the residents for their everyday living. Any unenclosed spaces, and any spaces used primarily for storage, economic activities, formal occasions, or circulation are excluded from this measurement. Because of these exclusions, it may be hypothesised that ódwelling areaô will be attuned to variations in co-residential group composition, and not vary too much according to practical factors (e.g. the inhabitantsô wealth or occupational specialisation).

4) *'Ground-plan area':* This measures the area of the residenceôs ófootprintô. It is assumed that the demographic characteristics of a co-residential group may be amongst the factors which determine a residenceôs óground-plan areaô.

These four variables, along with various others which feature less prominently in the investigation that follows (e.g. 'eating spaces'), are defined more precisely in the introduction to Appendix C, where the values for all 368 residences in the sample are presented in tabular form. It should be noted at this point that room counts deal only with spaces which are enclosed (roofed, and walled on all sides), in order to prevent counting indoor and outdoor areas used as seasonal alternatives for the same purpose. Further information about the way the table was compiled, and about the nature of the residential sample from each community, is given in Appendix D.

The next four sections of this chapter form a series of self-contained studies. Each section addresses one of the variables, and considers how it can be used to deduce the demographic characteristics of co-residential groups.

6.3 'Actual sleeping spaces'

ôActual sleeping spacesô are the spaces used by residents for sleeping. In the sample it is exceptional to find a residence in which each and every resident has access to complete privacy when they sleep. Out of 311 residences occupied by two or more people, only three allow for this possibility (H1016, K1005 and R1021)[50] while the remainder accommodate some residents who share one or more ôactual sleeping spacesô.

It would be reasonable to suppose that residents cluster together simply because residences contain insufficient ôformal sleeping spacesô to allow otherwise. If that were true, we might wonder why those who design residences consistently fail to provide occupants with the option to thoroughly isolate themselves as they sleep, despite differences in building costs, plot sizes, the relative endurance of construction materials and the intended length of occupation of the residences (all of which might be expected to have some bearing on the feasibility of constructing more rooms). But in fact a lack of ôformal sleeping spacesô cannot be the only explanation behind the clustering: of the 308 residences where residents share an ôactual sleeping spaceô, thirteen are equipped with enough spaces to accommodate each resident privately if they should wish. In ten of those residences, spouses share sleeping accommodation; in another three cases, a widowed parent sleeps together with an unmarried child.[51] These cases suggest that even when privacy is achievable, some categories of resident elect to cluster together when they sleep.

The first of the subsections below examines whether there are cross-cultural regularities in the way that co-residential group members cluster together for sleeping purposes. If common clustering patterns exist across the sampled societies, then the number of ôactual sleeping spacesô in any single residence could potentially provide a reflection of the demographic composition of its inhabitants. The second subsection explores whether ôactual sleeping spaceô counts can be used to derive: a) the population size; b) the structure of co-residential groups; and c) the residential pattern practised by a community.

[50] There are a total of 322 residences in the sample whose sleeping spaces have been enumerated and whose precise population is known, but 11 of them are discounted here because they are inhabited by lone individuals whose sleeping accommodation is, inevitably, private.

[51] The residences in which spouses who could potentially sleep apart in fact sleep together are: A1013, C1032, C1033, C1041, C1042, C1054, D1007, N1036, P1004 and P1015. The other three residences referred to are: H1019, R1002 and R1004.

6.3.1 Regularities and differences in sleeping arrangements within and across cultures

Clustering of spouses

Since most of the instances of clustering mentioned above involve spouses, the first issue to investigate is the frequency with which people who share a conjugal bond use the same ôactual sleeping spaceö as their partner.

Out of the 457 cases in the sample where husband and wife belong to the same co-residential group,[52] the vast majority of individuals do, in fact, sleep in the same space as their spouse (or one of their spouses), so that approximately 90% of conjugal unions are represented by a corresponding ôconjugal roomö. This clustering phenomenon is so common that it may initially be suggestive of a cross-cultural norm. Exceptions occur in communities such as Marrakech (M1012) and Anegondi (N1044, N1046), but their infrequency in the context of an otherwise strong local tendency marks these cases out as atypical.[53]

On the other hand, the more frequent rate of spousal separation characterising three of the communities in the sample merits further attention. In Kireyka women sleep in a separate hut to their husband in over one in ten (14%) cases where conjugal partners share the same residence.[54] In Denpasar, a quarter (25%) of women who live in the same residence as their husband sleep apart from him.[55] In Ibadan the rate of spousal separation is higher, with over half (56%) of married women sleeping apart from their husbands.[56]

If we had to guess at the reasons behind the decision to sleep apart, one obvious possibility might be a lack of regular sexual activity between spouses, for reasons such as advanced age or ritual responsibilities.[57] Whatever the causes of separation between conjugal partners, the relative frequency with which it occurs in Ibadan marks this community out as exceptional. In most of the sampled communities the decision of spouses to sleep apart is an uncommon

[52] There are 485 recorded instances in the sample where conjugal partners belong to the same co-residential group, but 17 of those couples occupy residences whose sleeping accommodation is not fully recorded, and the sleeping arrangements in another 11 residences were discussed above, so that only 457 couples concern us here.

[53] Eighteen pairs of spouses in Marrakech (95%), and 60 in Anegondi (97%), use ôconjugal roomsö.

[54] The four residences where women and their husbands sleep apart are: K1002, K1005, K1013 and K1024.

[55] The nine definite cases of spousal separation occur in D1001, D1003, D1006 (two cases), D1007, D1011, D1012 and D1014 (two cases). Sleeping arrangements have not been fully recorded in the sample of residences from Denpasar, so there may be additional cases of spousal separation.

[56] The 29 women who sleep apart from their husbands reside in: I1004 (six women), I1005 (four women), I1006 (two women), I1009 (four women), I1012 (four women), I1034 (two women), I1042 (one woman) and I1053 (six women).

[57] This is strongly implied by six instances of separation in Denpasar (in D1001, D1007, D1014, D1006, D1011, D1003), where the couple in question is the eldest in a multi-conjugal co-residential arrangement and the husband is also a family priest with religious duties.

one ï perhaps provoked in part by interpersonal friction or physical decline ï whereas in Ibadan the cases hint at a somewhat more systematic approach to the separation of conjugal partners. One gains the impression that, had space permitted it, all spouses would have chosen to sleep apart after the initial stage of marriage. In sizeable residences such as I1053, which has sixteen óformal sleeping spacesô, this is almost achieved.[58] The reason why several other co-residential groups fall short of this hypothetical target may be because they are currently experiencing a measure of overcrowding in their accommodation: I1006, I1009 and I1012 have such a shortage of óformal sleeping spacesô that even some co-wives are forced to share rooms, whilst the fact that several occupants of I1004 and I1005 sleep in communal hallways suggests that relatively large residences may also suffer from a shortage of such spaces.[59] It would seem, therefore, that in this particular context there may be a cultural propensity for spousal separation, but that this preference is sometimes not realised due to constraints on space.

A comparison of Ibadan with five of the other sampled communities (Aliabad, Capileira, Hasanabad, Pobia and Karapinar) reinforces this impression. In those communities, co-residing spouses *never* sleep apart in any of the 143 residences that accommodate a conjugal couple. This is despite the existence of an extra óformal sleeping spaceô (in addition to any óconjugal roomsô) in 50% of these residences, each offering conjugal partners the opportunity to sleep apart if they wished. Rather than being taken up by a spouse, most of these extra spaces are assigned to unmarried individuals, demonstrating that it is either undesirable to separate spouses, or that the segregation of other categories of co-residential group member takes precedence over such a desire. This is in contrast to the situation in Ibadan, where married individuals seem quite ready to disperse into the available rooms.

Thus, the clustering together of spouses may not be a cross-cultural phenomenon after all. Broude and Greeneôs investigation of relations between husbands and wives from 50 societies supports this (Broude and Greene 1983: 277, column 12), whilst also confirming what the present sample has shown: that societies which systematically split up conjugal partners into separate sleeping accommodation are rare.

[58] Six of the seven married female residents in I1053 occupy different óactual sleeping spacesô from their husbands, and only the headôs nephew sleeps in a óconjugal roomô.
[59] The two empty óformal sleeping spacesô depicted in Schwerdtfegerôs plan of I1006 (Schwerdtfeger 1982: 408) are almost certainly still under construction and thus currently unusable. It should also be noted that, although óformal sleeping spacesô that currently lie empty exist in six of the Ibadan residences, this may be because the corporate nature of property ownership in Ibadan (see Appendix A) prevents individual owners and their dependants from spreading out as they please across the residence, instead forcing them to occupy their apportioned area.

Clustering of parents with unmarried children

The second type of clustering that was noted earlier involved lone parents with unmarried children. The tendency for unmarried children to share a sleeping space with at least one of their parents has given rise to the generalisation that ñ[pre-pubescent] children go for the most part unrepresented in architectural termsò (David and Kramer 2001: 301; cf. David 1971: 128). The frequency with which this type of clustering occurs over the sample as a whole therefore becomes a matter of interest.

At first glance, the evidence from the sample seems to point to the existence of a cross-cultural pattern in which parents tend to sleep together with their children. Table 6.1 shows that the majority of lone parents, married couples, and mothers who sleep apart from their husbands, share a sleeping space with some or all of their children.

TABLE 6.1 Proportion of parents who sleep together with their unmarried children

	Total **n**	**Parent shares sleeping accommodation with unmarried children** **%**
Lone mother or father	**45**	87
Married mother and father who sleep in the same room	**357**	70
Married mother who sleeps apart from her husband	**23**	100

Almost nine in ten (87%) lone parents sleep in the same óactual sleeping spaceô as their unmarried children.[60] Moreover, there are five instances where an individual who is single and acts as a guardian for young relatives shares an óactual sleeping spaceô with her charges.[61] Separation occurs only six times: in two cases a mother sleeps with all her daughters but apart from her son (both occur in I1005) and in four residences a father or mother sleeps apart from all of his or her sons (in D1003, H1016, I1053 and K1006). These cases are too few to allow us to investigate whether lone parents prefer to sleep with daughters rather than sons, though this is a possibility. Lone parents presumably choose one child over another based on a variety of factors, including the child's age, the personal relationship between parent and child, and practical considerations.

[60] A lone parent is defined here as a parent who has been widowed, indefinitely separated, or divorced from their child's or children's other parent, and has sole guardianship of a child. In residences whose rooms have been fully enumerated, there are a total of 45 lone parents, consisting of 32 mothers and 11 fathers.

[61] In four of those cases the guardian is a grandmother, and in the other it is an aunt.

Seven in ten (70%) of the 357 married couples in the sample who live in the same residence as their unmarried children allow their children to sleep in their 'conjugal room'.[62] In fact this may be an underestimation, as it excludes several residences in Aliabad which have the potential to accommodate children separately, but where the actual sleeping arrangements are not known. Moreover, in every single case where a woman lives in the same residence as her husband but sleeps in a different room to him (n=23), the woman shares an 'actual sleeping space' with her children.

All of the above seems to indicate a widespread phenomenon in which parents and children cluster together in order to sleep. It is worth noting, however, that the residences which accommodate these parents and their children rarely offer residents the opportunity to spread out even if that was what they wished.[63] This raises the possibility that many instances of clustering may be circumstantial ï the result of necessity rather than preference ï and that the occupants of more spacious residences who are able to opt for separation are likely to do so.

An inspection of the communities where there is greater opportunity to spread out ï namely, Capileira, Denpasar, Marrakech and Pobia[64] ï bears out this suspicion: the frequency of separation between parents and unmarried children is indeed very high in contexts where space is less constrained.[65] In these communities, very occasionally a child will share sleeping accommodation with a parent while his or her siblings sleep elsewhere. In such situations, parents do not sleep with daughters any more often than with sons; instead, the youngest child is more likely to remain with the parent, and the eldest child most frequently

[62] There are 386 couples in the sample who live together with one or more of their unmarried children; however, 15 of them occupy residences whose óactual sleeping spacesô have not been recorded, and the sleeping arrangements in another seven residences were not fully described by the relevant ethnographers, so that only the remaining 357 couples are taken into account here.

[63] Nine in ten (88%) of the 250 married couples who sleep with each other and in the company of all their children inhabit residences where every óformal sleeping spaceô apart from the one which functions as their óactual sleeping spaceô is taken up by another couple or by a widow or widower (some of whom are accompanied by their own offspring). Assuming that the occupants of those other rooms would probably not be willing to share their sleeping spaces with other peopleôs children, this means that just over a tenth of parents have the choice to sleep apart from their own children.

[64] The average number of óformal sleeping spacesô per residence in these four communities is 3.64 (n=75), whilst in the other nine communities it is only 1.85 (n=275). Ban Touei residences are excluded from this calculation, since their sleeping accommodation has not been recorded.

[65] In Capileira, six of the seven couples who have unmarried children sleep apart from those children. In Denpasar, the corresponding figure is ten out of 12; moreover, within residences D1001, D1003, D1007, D1011, and D1015, whose residents are not included in the calculation because their distribution across those residences is only partly recorded, there are at least eight couples who are known to sleep apart from some or all of their unmarried children, suggesting that separation is widely practised within the sampled residences from that community. In Marrakech, nine of the 16 couples with unmarried children sleep apart from some of them. In Pobia, 27 of the 28 couples with unmarried children sleep separately from their children.

provided with separate accommodation.[66] The picture from these four communities would seem to suggest that parents prefer to sleep apart from their unmarried children but make exceptions for the very young, perhaps because of their greater need for parental supervision.

Nevertheless, not every incidence of clustering between parents and unmarried children in the sample can be put down to constraints on space. In Hasanabad, half (48%) of the couples who have unmarried children are able to offer them a separate óformal sleeping spaceô to sleep in, yet every set of parents chooses to sleep together with all of their children. The inhabitants of Baghestan and Willow Lake consistently build residences with no more than one óformal sleeping spaceô, suggesting that parents in those communities are invariably prepared to sleep in the company of their unmarried children.

Behind these decisions there may lie a concern for construction costs or economies of scale. The need to conserve fuel for heating, for example, is likely to favour clustering, especially under the dire economic conditions current in Hasanabad. In communities such as Willow Lake, the time and capital investment needed to construct additional óformal sleeping spacesô to accommodate parents and children separately may not be deemed worthwhile, given the brevity of each period of occupation.[67]

Another possibility is that the inhabitants of Hasanabad and Baghestan have a different attitude towards privacy, independence and visual monitoring from that held by the inhabitants of Capileira, Denpasar, Marrakech and Pobia. In Baghestan, for instance, where ñ[w]anting to be alone is regarded with suspicionò (Horne 1994: 119), separating oneself from oneôs children may not be viewed as appropriate or desirable. Various cross-cultural investigations on the sleeping habits of young children suggest that parents in many societies are ideologically predisposed to fostering a sense of closeness, dependence and solidarity amongst their offspring, rather than the sense of individuality valued in Western societies,

[66] This is most clearly demonstrated in Marrakech, where there are seven incidences of preferential retention of some children and not others by their parents. In all seven cases, it is the youngest child (together with one or more siblings who are positioned late in the familyôs birth order) who sleeps with the parents. In six of the cases, the eldest child sleeps apart from his or her parents, usually accompanied by several sisters and/or brothers. The pattern also holds in the other cases where parents cluster with selected children: these occur in Xculoc (X1040) and Ibadan (I1004, I1042 and I1053). It should be noted that as a consequence of under-reporting and over-generalisation by ethnographers the sharing of an óactual sleeping spaceô by parents and a young child may in fact occur more frequently than indicated. For example, although children in Pobia normally sleep in rooms labelled as óchildrenôs bedroomsô, some of Trovaôs residence plans (Trova 1989) show the presence of an extra single bed in the so-called óparentsô bedroomô (e.g. P1001, P1008), which is probably used by a child.

[67] It is interesting to compare Willow Lake to Kireyka, where occupation is also periodic, but where six of the 22 couples with unmarried children *have* provided some of their offspring with separate accommodation. This may be because building costs for the short-lived, communally constructed wattle-and-daub huts of Kireyka are relatively low compared with the more sturdy and durable log cabins of Willow Lake (see Appendix A).

and explain the phenomenon of regular bed-sharing between parents and children in these terms (Morelli et al. 1992). The four communities in the sample characterised by a high rate of separation have closer ties to the Western world and global economy (see Appendix A); therefore the tendency for parents to sleep apart from their unmarried children could be understood as a sign that Western concepts of individuality and privacy have had some influence on those populations.

Taking all of the above into account, we can conclude that parent-child clustering is probably not a cross-cultural phenomenon. The decision to share sleeping accommodation depends on attitudes to privacy and independence, and is contingent on the availability of rooms as well as practical considerations (e.g. the need to contain the costs of construction or heating).

Clustering of married couples with unmarried individuals (other than children)

A further question concerns the frequency with which married couples share sleeping accommodation with single or unmarried individuals who are not their children. As Table 6.2 shows, this is not particularly common in the sample.

TABLE 6.2 Proportion of married couples who sleep together with a single/unmarried relative

	Total	**Couple shares sleeping accommodation with unmarried relative**
	n	**%**
Married couple who live with a widowed or divorced parent (either of the husband or of the wife)	**61**	30
Married couple who live with other single relatives	**90**	17

In less than a third (30%) of the 61 cases where a couple co-resides with one of their parents does the widowed or divorced parent sleep in the couple's 'conjugal room'. Most of the cases where clustering occurs may be explained as a consequence of insufficient 'formal sleeping spaces'[68] or other habitable rooms.[69] However, since not all suitable rooms are actually used

[68] In 17 of the 18 cases where a lone parent shares an 'actual sleeping space' with a married child, there is no extra 'formal sleeping space' in the residence capable of accommodating the parent separately. The exception is in H1008.

[69] 'Cooking spaces', for example, may be deemed habitable, and could theoretically act as expedient sleeping accommodation for lone parents. In fact, widows do sleep in rooms labelled as 'kitchens' in residences A1041, A1049, A1067 and P1030 (in Aliabad and Pobia).

for sleeping,[70] space constraints are unlikely to be the sole reason why some widowed parents end up sleeping together with their married child.

As the previous discussion proposed, heating considerations, building costs, or the intended duration of the arrangement may also play a part in making this type of separation unattractive to the inhabitants of seven of the communities (Baghestan, Hasanabad, Willow Lake, Anegondi, Karapinar, and Xculoc). In fact separation never occurs in the former three communities, so perhaps a cultural predisposition towards this type of clustering is also a factor there. By contrast, in the other seven sampled communities (Aliabad, Capileira, Denpasar, Ibadan, Kireyka, Marrakech and Pobia) there is a consistent effort to provide widowed or divorced parents with independent accommodation. This is suggestive of a distinct preference for separation in those societies.

In all fourteen communities there is an apparent aversion towards sharing "conjugal rooms" with other categories of single relative. Less than one fifth (17%) of couples who live with a single relative share an "actual sleeping space" with them,[71] and in fact most of those who do cluster together (ten of the 15 cases) inhabit residences whose capacity does not give them the option to sleep apart.

Clustering of married couples with other married couples

A more striking picture emerges with regard to married relatives. In situations where a couple resides with one or more of their married relatives, it is remarkable how few couples are willing to tolerate a communal sleeping arrangement (Table 6.3).

[70] A spare "formal sleeping space" is available in H1008, but the widow instead sleeps with her married son and his wife and children (Watson 1979: 204). "Cooking spaces", which could potentially be used for sleeping, are available in residences N1002, N1003, N1006, N1015 and N1029 in Anegondi, R1010 in Karapinar, and X118S in Xculoc; none are actually used for sleeping, and the parent of the couple instead sleeps in their child's "conjugal room".

[71] The sample contains 90 individuals who are unmarried, widowed, divorced or permanently separated from their spouse, who occupy the same residence as a related conjugal couple. Children or parents of the couple are not counted here. Instead the count consists of the siblings, aunts, uncles, nieces, nephews and grandchildren of either conjugal partner.

TABLE 6.3 Proportion of married couples who sleep together with another married couple

	Total n	Couples share sleeping accommodation %
Married couple who live with the husband's parents or the wife's parents	**52**[72]	12
Married couple who live with another related married couple	**275**[73]	6

Only one in eight (12%) couples who live in the same residence as a married child and his or her spouse sleep together in the same space.[74] This apparent aversion against sleeping with other married couples does not apply only to parents and their offspring, but to all couples, regardless of the type of kinship bond they share. Thus, while the sample contains 275 potential opportunities for pairs of married relatives to crowd together in a single room and so avoid investing in an additional 'formal sleeping space', residents in fact take advantage of only one in twenty (6%) of these opportunities, the great majority of couples opting to sleep in separate rooms despite the costs involved.

Where clustering does occur, this is chiefly in residences where the co-residential group has recently experienced a change in its composition, suggesting that sharing a room may be a temporary arrangement. In six of the nine residences where couples double up together, the group's population has recently become inflated by the addition of a pair of newlyweds, and there may not have been enough time or funds to add a 'formal sleeping space' or convert an

[72] There are 57 sets of parents occupying the same residence as at least one married child and his or her spouse(s). However the 'actual sleeping spaces' in six of these residences have not been fully recorded, and in another eight cases spouses in one or both generations do not use 'conjugal rooms', so only the 43 remaining sets of parents are considered here. Some of those parents co-reside with more than one married child, so there are actually 52 opportunities for this type of clustering to occur.

[73] There are 81 residences in the sample whose sleeping spaces are fully recorded and which accommodate two or more couples related through a recognised kinship bond. These residences accommodate 214 married couples, excluding those who have no relation to any other couple within their co-residential group (these are usually families of lodgers). The types of bonds counted include: parents with married child, married siblings, married half-siblings, couples who have one partner in common, married uncle with married nephew, married cousins, and married second cousins, as well as more remote in-law relations (as in D1002). Altogether, the 81 residences offer 275 potential opportunities for pairs of married relatives to cluster together. More clustering combinations are theoretically possible for groups containing more couples: the clustering opportunities range from one in any two-conjugal group (e.g. H1028), to 66 in a twelve-conjugal group (I1009). Thus the total number of opportunities exceeds the total number of couples involved.

[74] Couples who share a sleeping space with a set of parents can be found in the following residences: A1048, I1009, N1023, W1003, X1017 and X1030.

existing room into habitable sleeping accommodation for that couple.[75] A seventh co-residential group (N1023) is in the process of adding a new room to its residence, which could be interpreted as a delayed attempt to bring the residence capacity in line with the number of couples in occupation. The other instances of clustering occur in residences that are markedly overcrowded: in I1009, most of the men who have taken advantage of their right to co-residential group membership in the corporately-owned residence happen to be polygamous, and the number of 'formal sleeping spaces' falls far short of the number of couples in the group; in N1029, the families of two brothers crowd together in a residence that was expressly built for the use of only one of them, following the peculiar decision to dedicate the entire neighbouring residence ï which has identical dimensions and layout, and was specifically intended to accommodate the family of the other brother ï to sheltering cattle. Barring such circumstantial anomalies, the separation of couples would be universal.

In short, couples from all 14 communities normally avoid sharing 'conjugal rooms' with one another. This is the most salient regularity in sleeping arrangements in the sample, and could perhaps be attributed to a common perception across many societies that individual conjugal couples are due a singular degree of privacy or autonomy within their residence. This is underscored by the fact that 'conjugal rooms' are almost always independently located with respect to one another, so that one 'conjugal room' does not provide the only means of access to another (a situation which would compromise the privacy of a couple).[76]

[75] This is the case in A1048, H1031, I1006, W1003, X1017 and X1030, where the couple in question is assumed to be recently formed because it is either childless or has no more than one or two infant children. In five of these residences, every other 'formal sleeping space' is occupied by another couple (with or without unmarried children) and is thus unavailable for their use. In the case of X1017, the second 'formal sleeping space' accommodates an elderly widower, whose spouse may still have been alive and using the space as a 'conjugal room' when the young couple married.

[76] There are 73 residences in the sample which contain more than one 'conjugal room'; only three of them (4%) are not 'independent' in the sense used here. The exceptions are: A1050, N1028, N1040. Note that 'independence' is not exclusive to 'conjugal rooms'. Nor are 'conjugal rooms' in any way distinctive to other 'actual sleeping spaces' in their residences: for example, amongst the 26 residences in Pobia that have more than one 'actual sleeping space', only nine (35%) have a 'conjugal room' which is discernibly larger (i.e. has a difference of more than $1m^2$ in area) than the other 'actual sleeping spaces' in the residence.

Summary

The trends identified above suggest that sleeping arrangements are not made haphazardly; instead, sleeping accommodation is assigned to residents in such a way as to separate certain categories of co-residential group member from one another wherever possible.

In general, when a residence has fewer ‘formal sleeping spaces’ than the number of residents in the group – as is usually the case – the first priority is to ensure that each couple has a ‘conjugal room’ of its own. The separation of one couple from another occurs consistently across the entire sample, giving us reason to think that it may also hold true in other cultures that have not been covered here.

If there are habitable spaces still left over, unmarried individuals may be provided with sleeping accommodation of their own. The allocation of sleeping space often follows a fairly standard order of priorities. Generally speaking, precedence seems to be given first to unrelated persons or fairly distant relatives of the couple, next to their widowed or divorced parents, and then to unmarried children in descending birth order. Finally, if there are any ‘formal sleeping spaces’ still remaining, the conjugal partners may also decide to sleep apart.[77]

Even such a small cross-cultural sample, however, reveals exceptions to the above, demonstrating that cultural ideologies and practical considerations can interfere with this typical order of priorities. For instance, amongst the inhabitants of Ibadan, the inclination to segregate spouses from one another apparently overrides any desire a mother might have to sleep apart from her unmarried children, so that a woman can more often be found sharing an ‘actual sleeping space’ with her children than with her husband. Cultural attitudes that encourage physical closeness between immediate relatives in Hasanabad, Baghestan and Willow Lake may be partly responsible for the fact that unmarried individuals are allowed to sleep in the ‘conjugal room’ of a related married couple. Small building plots, high construction costs, a short intended period of occupation or prohibitive heating expenses may also have discouraged the creation of extra ‘formal sleeping spaces’ and the dispersion of residents in those contexts.

[77] This order of priorities has been inferred from quantitative observations based on the sample, but will probably make sense on an intuitive level to anyone from a modern Western background. Notably, it also broadly corresponds with the criteria used in the official British ‘Bedroom Standard’ (see section 1.1).

6.3.2 Deriving co-residential group demographics from 'actual sleeping space' counts

Size

The tendency for residents to cluster together for sleeping purposes appears to be a cross-cultural phenomenon. Because of this, the number of óactual sleeping spacesô in a residence rarely corresponds with the total number of people in occupation. Counting the number of óactual sleeping spacesô can instead give an idea of the residenceôs *minimum* population. Only in contexts such as Denpasar, where private sleeping accommodation is often allocated to unmarried persons of all ages, and even to individual spouses in some cases, do residents becomes more or less equally ñvisibleò in architectural terms,[78] allowing an óactual sleeping spaceô count to be translated into an approximation of absolute population size.

A count of óactual sleeping spacesô can serve more generally as an index of *relative* population size. In most of the communities in the sample, the correlation between the two variables is moderate to good.[79] This should occasion little surprise. Additional óactual sleeping spacesô are usually allocated because the co-presence during sleeping hours of certain categories of resident is deemed undesirable or intolerable, and it becomes necessary to redistribute some of them to other spaces in the residence. If the inhabitants of two residences have similar preferences and tolerances concerning sleeping arrangements and so distribute residents in similar ways ï as one would expect in a culturally homogeneous community ï then a greater number of óactual sleeping spacesô in one residence as compared to another would very probably result from the need to distribute a larger pool of residents. Hence, more populous co-residential groups are typically associated with residences which have higher óactual sleeping spaceô counts.[80]

The principle that underlies the relationship observed in the sample between relative population size and 'actual sleeping space' counts should hold true in communities outside the sample. If so, the enumeration of óactual sleeping spacesô offers a simple, if imperfect,

[78] Unmarried persons (particularly young female siblings) occasionally share rooms, and so do some conjugal partners, so that the correspondence between óactual sleeping spacesô and population in Denpasar is not actually 1:1. Nevertheless, a crude calculation can serve to demonstrate that the correspondence in Denpasar is better than in other communities in the sample: taking the mean number of inhabitants per óactual sleeping spaceô for each residence in the sample, the average of the means in Denpasar is 1.73 (n=13), whilst the equivalent value in other communities where a calculation is possible is higher (ranging from 1.9 in Capileira, to 5 in Willow Lake).

[79] The r^2 value for the relationship between population size and number of óactual sleeping spacesô ranges from 0.23 for Anegondi to 0.73 for Xculoc, and is significant at the 0.05 level. Note that calculations could not be carried out for Willow Lake, Ban Touei, and Pobia. Across the rest of the sample, $r^2 = 0.56$.

[80] This is backed up by the observation that the mean population size of co-residential groups occupying residences with two óactual sleeping spacesô is higher than the mean population size of groups occupying residences with one óactual sleeping space'. This is true for every community where a calculation is possible.

means of comparing co-residential group population sizes within the same community.

Structure

One of the most significant points to have emerged in the discussion above is that every conjugal couple requires its own ‘conjugal room’. This was true across the communities in the sample, and quite possibly applies to other cultures. If every couple expects to sleep in its own room, it follows from this that two-conjugal groups cannot be satisfactorily accommodated in residences with a single ‘formal sleeping space’, nor three-conjugal groups in residences with just two ‘formal sleeping spaces’. The number of independently located ‘formal sleeping spaces’ in a residence can therefore provide a rough indication of the complexity of the co-residential group.

The number of ‘formal sleeping spaces’ in a residence may, however, exceed the spatial requirements of the current set of occupants. This can happen for several reasons: because some ‘formal sleeping spaces’ were created to meet the needs of a differently structured co-residential group who lived in the residence previously; because some were created in anticipation of the group’s development in the future; or even because extra rooms were required to offer to guests.[81] Wherever rooms are spare in communities within the sample, unmarried individuals take advantage of the opportunity to spread out: in Aliabad, Xculoc, and particularly Karapinar, most ‘formal sleeping spaces’ that are not currently in use as ‘conjugal rooms’ have been claimed as private sleeping accommodation by residents who are lower than couples on the order of priorities described earlier, i.e. distant relatives, lone parents or older unmarried children. This may also be the case in communities outside the sample. For this reason, the number of 'formal sleeping spaces' in a residence should be thought of as indicating the *potential* complexity of the co-residential group in occupation.

Residential pattern

Residences with high ‘formal sleeping space’ counts are theoretically capable of accommodating multi-conjugal groups, but in communities characterised by a nuclear

[81] The first explanation applies to the long-lived residence I1001 in Ibadan, where the existence of a previously larger co-residential composition is recorded in an occupation history chart (Schwerdtfeger 1982: 126); it probably also applies to many of the residences in Hasanabad with so-called ‘utility rooms’ or abandoned rooms, such as H1019 and H1042. The second explanation seems likely for three of the most-recently constructed residences in Aliabad (aged ten years or less), which already contain more ‘formal sleeping spaces’ than are required by their respective co-residential groups. These are: A1013, A1035 and A1083.

residential pattern they would rarely do so in reality.[82] In such situations, no more than one ‘formal sleeping space’ is normally taken up by a conjugal couple, whilst any other ‘formal sleeping spaces’ in the residence are purpose-built to accommodate unmarried residents or guests.[83] It is helpful, therefore, to be aware of the residential pattern in operation in the community in question when translating ‘formal sleeping space’ counts into demographic information about its inhabitants.

There is no significant difference between communities with nuclear and joint residential patterns in the number of ‘actual sleeping spaces’ per residence. Figure 6.1 shows how frequently each count occurs in 13 of the 14 communities: from this it is evident that residences equipped with one, two, three or four ‘actual sleeping spaces’ are common in both types of community. Nevertheless, attention should be drawn to a couple of points.

Firstly, the only cases of uniform (or near-uniform) counts occur in contexts where a nuclear pattern operates. Baghestan and Willow Lake consist almost exclusively of residences which contain no more than one 'formal sleeping space'. Notably, the two residences amongst them with higher counts (B1003, B1004) are readily recognisable for the exceptions that they are: one stands out for its unusual size and fortified plan (suggesting that it had previously functioned as something other than a residence), and the other is apparent as an instance of amalgamation between two residences. Whilst the manifestation of one ‘formal sleeping space’ per residence throughout an entire community is by no means a feature of all communities which practise a nuclear residential pattern, this phenomenon is unlikely to occur in settings where conjugal couples are expected to co-reside, as is the case in communities with stem or joint residential patterns. Under those circumstances, we would expect that at least some co-residential groups would attain a multi-conjugal structure, and accordingly provide their residences with two or more separate ‘conjugal rooms’. Thus, the community-wide occurrence of residences designed with just one 'formal sleeping space' is probably peculiar only to societies that practise a nuclear residential pattern. If so, this could

[82] Only rarely do multi-conjugal groups form in such contexts. Fortunately, co-residential groups that have formed expediently are often readily identifiable by their residences. In Baghestan, for example, the three-conjugal group B1003 occupies the unique fortified *Q’ala*; while in Kireyka, all instances of multi-conjugal occupancy can be distinguished by the use of thorn fencing around multiple compounds. It should therefore be possible to pick out such exceptional residences from a settlement plan, and anticipate that the composition of their co-residential groups would quite possibly differ from that elsewhere in the community.

[83] In Capileira and Pobia, two communities that practise a nuclear residential pattern, residences with more than one ‘actual sleeping space’ are significantly associated with groups of one-conjugal structure that also contain unmarried persons (Capileira: X^2 =5.19, df=1, p<0.05; Pobia: X^2 =13.75, df=1, p<0.001; Yates’ correction for continuity applied). Contrast this with the situation in Aliabad, Hasanabad, Anegondi and Xculoc, four communities that practise a joint residential pattern. In these four communities, residences with more than one ‘actual sleeping space’ are instead associated with groups of multi-conjugal structure (Aliabad: X^2=19.65, df=1, p<0.001; Hasanabad: X^2=18.57, df=1, p<0.001; Anegondi: X^2=13.75, df=1, p<0.001; Xculoc: X^2=30.14, df=1, p<0.001; Yates’ correction for continuity applied).

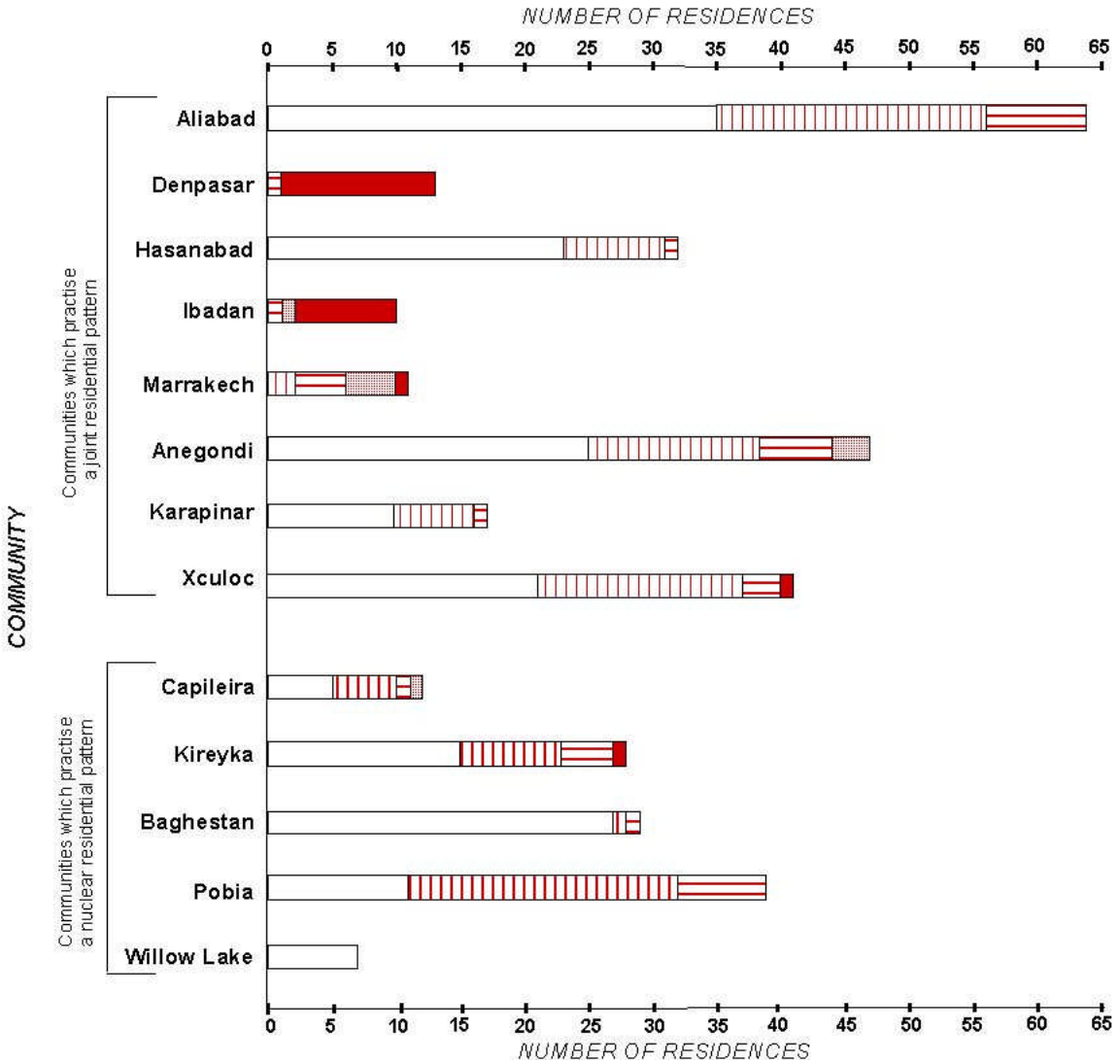


FIGURE 6.1
Frequency of 'actual sleeping space' counts in thirteen of the communities in the ethnographic sample

serve as an indicator of societies outside the sample that practise a nuclear residential pattern.

Secondly, óactual sleeping spaceô counts of five or more occur rarely in the sample, but are particularly rare in communities that practice a nuclear residential pattern. This is also true of óformal sleeping spaceô counts of five or more. In communities where multi-conjugal occupancy occurs as a matter of course, numerous óformal sleeping spacesô may be required to cater for the spatial needs of very complex co-residential groups; but in communities where multi-conjugal occupancy does not occur as a matter of course, such a high demand for óformal sleeping spacesô would be unlikely. Theoretically this situation might arise if the occupants are exceptionally affluent and require live-in assistance or spare sleeping accommodation to offer to guests, or if the members of a co-residential group are numerous and have the cultural pre-disposition and financial means to provide separate sleeping accommodation to each individual member of their group. Unfortunately there is insufficient data from the sample to test this hypothesis. However, if this is the case, then as long as affluence can be recognised and controlled for, óactual sleeping spaceô counts or óformal sleeping spaceô counts of five or more could potentially serve as indicators of societies outside the sample that practise a joint residential pattern.

6.4 'Cooking spaces'

óCooking spacesô are enclosed spaces containing facilities for the preparation of meals. Whilst every member of a co-residential group uses an óactual sleeping spaceô, it is not necessarily the case that all members co-operate in cooking. If the number of ócooking spacesô in a residence can tell us anything about the composition of the group, it would likely be about the subsets of residents who cook together. These subsets are referred to here as óculinary unitsô. The first subsection below discusses how óculinary unitsô distribute themselves across the ócooking spacesô of a residence. The next subsection uses this information to explore whether the structure of co-residential groups can be derived from ócooking spaceô counts.

6.4.1 Regularities and differences in the use of 'cooking spaces' within and across cultures

Cooking is barely discussed in the ethnographic reports from which the sample is compiled, whereas residents who óeat from the same potô often are. If we assume that cooks invariably eat the food prepared by their own efforts, then it follows that one óculinary unitô will exist amongst each set of residents who óeat from the same potô. This premise helps us identify 239 óculinary unitsô across 185 co-residential groups from the sample.[84]

[84] These cases are drawn from six of the 14 communities (Aliabad, Hasanabad, Ibadan, Kireyka, Marrakech and Xculoc) where the ethnographer records residents who 'eat from the same pot' . No equivalent information exists for the rest of the communities.

In over eight in ten (85%) of those cases, there is only one ‘culinary unit’ per co-residential group, while the remaining 27 co-residential groups contain two or more ‘culinary units’. The presence of more than one ‘culinary unit’ in the co-residential group occurs in two types of situation: when the co-residential group contains persons unrelated to the co-residential group head (e.g. tenants or lodgers);[85] or where multiple conjugal couples live together.[86]

A quick look at the residences where all these 'culinary units' live might initially cause us to think that every 'culinary unit' is allocated its own 'cooking space': where there is just one 'culinary unit' in the group, there is only one 'cooking space' in the residence, while co-residential groups that contain more than one ‘culinary unit’ often live in residences equipped with more than one ‘cooking space’. However the relationship between ‘culinary units’ and ‘cooking spaces’ is not always one-to-one. Evidence from several communities shows that co-residential groups can make do without a ‘cooking space’ at all in their residence, preferring to cook outdoors or in an annex building instead (e.g. R1006, R1008 and B1014). Elsewhere, ‘culinary units’ do not have their own 'cooking space' but instead time-share the same facilities with other co-resident ‘culinary units’ (e.g. M119B in Marrakech) or use separate facilities within a single ‘cooking space’ (e.g. I1034 in Ibadan). In fact, almost a quarter (23%) of co-residential groups known to contain more than one ‘culinary unit’ live in residences with fewer ‘cooking spaces’ than there are ‘culinary units’.

It is clear, therefore, that ‘cooking space’ counts may fall short of the number of ‘culinary units’ in a co-residential group. What we *can* say with certainty is that the only residences in the sample to contain more than one ‘cooking space’ are those that accommodate more than one ‘culinary unit’.

Drawing together what we know about ‘culinary units’, this suggests that residences with more than one ‘cooking space’ are likely to accommodate co-residential groups containing persons unrelated to the head, or multiple conjugal couples. We would therefore expect to be able to derive some demographic information about co-residential groups by enumerating the ‘cooking spaces’ in their residences.

[85] This is true in all seven co-residential groups containing lodgers or tenants, where ‘culinary units’ can be identified: H1009, H1035, I1034, I1053, M119B, M1066 and M119A.

[86] Separate ‘culinary units’ have been identified in the following multi-conjugal co-residential groups: H1009, H1018, H1025, H1028, H1031, H1034, H1042, I1005, I1006, I1009, I1034, I1053, K1008, K1015, M1012, M1066, M128A, X1003, X1009, X1016, X118S, X1020, X1023, X1030. Note, however, that multi-conjugal groups do not always contain more than one 'culinary unit'. For example, all the multi-conjugal groups in Aliabad (n=19) and several multi-conjugal groups in Xculoc (n=11) contain just one ‘culinary unit’.

6.4.2 Deriving co-residential group structure from 'cooking space' counts

The sample provides strong empirical evidence for an association between multiple ócooking spacesô and co-residential groups of multi-conjugal structure.[87] Unfortunately there is insufficient data within the sample to explore the statistical relationship between multiple ócooking spacesô and the presence of persons unrelated to the co-residential group head (e.g. lodgers, tenants, servants or other live-in assistants). Because of this limitation and limitations in the nature of the sample (see section 1.2.2), ócooking spaceô counts of two or more in contexts outside of the sample should be interpreted with some caution.

No other significant association was found between 'cooking space' counts and co-residential group composition. For example, ócooking spaceô counts are only mildly correlated with co-residential group size,[88] and there is no apparent pattern between 'cooking space' counts and the residential pattern practised by a community (Figure 6.2).

[87] X^2=91.04 (with Yatesô correction for continuity), *df*=1, p<0.001. There are six residences in the sample that accommodate a no-conjugal or one-conjugal group but appear to contain two ócooking spacesô (B1022, B1028, K1022, D1015, H1016 and H1035). In five of those cases, the ócooking spaceô count is almost certainly inflated by the erroneous inclusion of a space used only for secondary cooking activities such as bread-making or tea-brewing, or a space with a defunct oven. H1035 is an instance of a co-residential group containing lodgers.

[88] r^2=0.16, n=334, p<0.001.

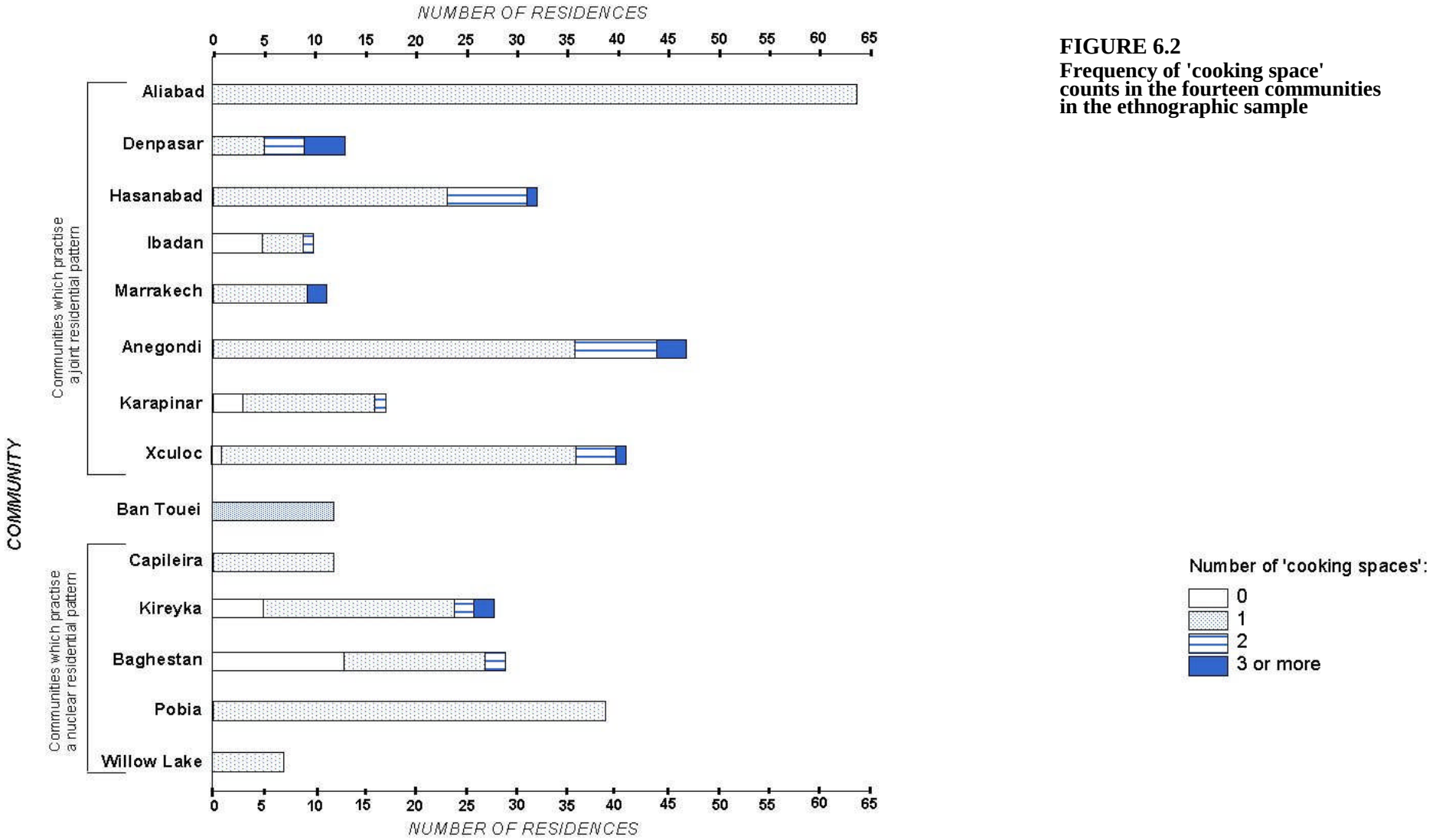


FIGURE 6.2
Frequency of 'cooking space' counts in the fourteen communities in the ethnographic sample

6.5 'Dwelling area'

A residence's total 'dwelling area' is made up of all the enclosed spaces used by members of the co-residential group on a day-to-day basis for their everyday living. In theory, the number and the dimensions of the spaces the residents need for their daily use should be contingent (to some degree) on the group's demographic make-up. However, a number of practical considerations should also be factored in. The aim of the first subsection below is to consider all the factors that have a potential bearing on 'dwelling area', and to distinguish between those that are related to the demographic characteristics of the co-residential group and those that are not. The next subsection investigates whether it is possible to use 'dwelling area' to identify a) the population size of co-residential groups; b) their structure; and c) the residential pattern practised by a community.

6.5.1 Regularities and differences in 'dwelling areas' within and across cultures

Sleeping, cooking, eating, and any other communal activities that residents engage in daily may take place either across a number of rooms in the residence or within a single space or small set of spaces. It is this ï the degree of 'spatial dispersion' ï which seems to be responsible for gross disparities in 'dwelling areas' across different communities in the sample.[89]

Various hypotheses may be put forward as to why some communities design their residences with few spaces and assign them multiple functions, whilst others design residences with many spaces which have restricted uses. The latter may apply if there is a cultural perception that some activities are 'polluting' and need to be accommodated separately. Conversely, multifunctional spaces may be common amongst communities with makeshift and temporary residences, where the intended period of occupation is too short to merit the construction costs necessary to accomplish further spatial differentiation (Oswald 1987). The only community in the sample to be occupied on a strict seasonal basis (Willow Lake) conforms with Oswald's proposal, but more communities of this nature would be required to demonstrate it securely. Generally speaking, there is not enough information available to us

[89] This becomes evident when comparing the four communities where 'cooking spaces' tend to double as 'actual sleeping spaces' (Baghestan, Hasanabad, Kireyka, and Willow Lake), with the other ten communities in the sample where this is not a common occurrence. In the first set, the average 'dwelling area' ranges from 18m^2 to 25m^2; in the second set, from 40m^2 to 55m^2 (with much larger values for Denpasar and Ibadan, where 'dwelling areas' are inflated by relatively high counts of 'actual sleeping spaces' and 'cooking spaces').

about the communities in the sample to test such hypotheses.[90]

Climatic conditions perhaps also cause ódwelling areaô to vary from community to community. Climatic conditions are not recorded in detail in the ethnographic reports, but they presumably play a role in determining whether particular everyday activities are carried out in enclosed rooms (which contribute to ódwelling areaô) or in unroofed spaces (which do not).

Differences in 'dwelling area' do not just occur between communities, however. Residences belonging to a single community may also have quite different ódwelling areasô. One reason for this is that they have been equipped with unequal numbers of óactual sleeping spacesô and ócooking spacesô. Another is that some co-residential groups perform each of their daily activities in separate rooms, whereas other groups perform those same activities in a single space. Lastly, the size of the individual spaces in which the activities are carried out may also differ between one residence and another. Each of these reasons is discussed in turn below.

Variation within communities in the provision of sleeping and cooking spaces

In discussing sleeping and cooking arrangements in previous sections of this chapter, reference was made to the unevenness in the distribution of spaces used for each of these two purposes. It was argued in subsection 6.3.1 that separate óactual sleeping spacesô are used to keep apart categories of resident who, according to local custom, must not sleep together (a concept which applies, above all, to different conjugal couples). Consequently, the number of óactual sleeping spacesô in any given residence is partly contingent on the composition of the co-residential group occupying the residence. A measure of personal choice, presumably tempered by financial and spatial considerations, may also be involved, as, for example, when individual unmarried children who could tolerate sharing a space with a sibling are instead provided with private sleeping accommodation. The replication of ócooking spacesô is also optional, with co-resident óculinary unitsô often preferring to cook in separate spaces, but evidently able to tolerate the sharing of a single ócooking spaceô when circumstances do not permit otherwise (subsection 6.4.1).

[90] Another suggestion which will not be followed up here is that made by Kent (Kent 1990). On the basis of a cross-cultural ethnographic study, she proposed that little or no architectural separation between residential activity areas is consistently linked to a low level of socio-political complexity. This association is hardly surprising, however, since the definition used to classify the relative complexity of societies rests in part on the degree of temporal and spatial separation that exists between people of differing genders, statuses, and economic roles (ibid. 127). Thus, the variables being compared ï architectural segmentation and social segmentation ï share a common spatial element and are not completely independent of each other.

Variation within communities in the degree of 'spatial dispersion'

ôDwelling areaô may vary from residence to residence because the co-residential groups in a community are inconsistent with regards to carrying out their daily activities in separate spaces. Activities that would normally take place in separate spaces are in some residences carried out in a single space. Where this happens, it can often be explained by practical difficulties facing the occupants, such as restrictions in time or capital.

Within the sample it is not unusual to find that a single space is made to accommodate different daily activities at an early stage in a residenceôs construction process, before there has been enough time to build all the rooms that are planned for the residence (cf. Oswald 1987: 331).[91] Rooms may also double up as sleeping accommodation in situations where occupants have not had sufficient time to carry out any architectural modifications following a change in the co-residential groupôs membership (cf. Oswald 1987: 332).[92] In the longer-term, we would expect the occupants to attempt to rectify the situation by converting an existing room into an additional ôformal sleeping spaceô, by constructing a new ôformal sleeping spaceô, or through the departure of some members of the group.

The conflation of activities may instead occur because the occupants of a residence lack sufficient funds to construct single-purpose rooms.[93] Although there is very little socio-economic data available about individual co-residential groups from the sample, there are strong indications from two of the communities ï Baghestan[94] and Anegondi[95] ï that groups

[91] This is apparent in Xculoc, where residences usually undergo a lengthy process of construction spanning a number of years. Five of the seven residences whose construction began within the last ten years consist of a multifunctional space used for both cooking and sleeping, whereas in almost all other residences in the community, ôcooking spacesô are separate rooms. The five young residences with a single multifunctional space are: X1005, X1010, X1021, X1029 and X1031. Notably, the temporary stage of conflation is on the brink of ceasing for one of those five (X1021), whose occupants have already begun constructing a separate ôcooking spaceô.

[92] In Aliabad, for instance, there are eight residences which contain a room fitted out as a ôkitchenô which doubles as both a ôcooking spaceô and an ôactual sleeping spaceô; in five of them, a resident recently introduced a new spouse into the co-residential group, and the need for an additional ôconjugal roomô has forced either the new couple or other members of the group to sleep in the ôkitchenô. The five residences are: A1001, A1018, A1049, A1065 and A1067.

[93] It is on this basis that Kamp predicts a positive correlation between ôhousehold wealthô and a residenceôs number of rooms in contexts where construction costs are high (Kamp 1987: 289).

[94] In Baghestan, residents normally sleep and cook in multifunctional ôliving roomsô. Three residences are exceptional in having a separate monofunctional ôcooking spaceô in addition to a ôliving roomô (B1028, B1029 and B1033). All three are occupied by co-residential groups belonging to the communityôs highest wealth quartile, as estimated on the basis of their land and animal holdings (Horne 1994: Table 12). Across the community as a whole, ôdwelling areaô has a weak positive correlation with wealth (r^2 =0.15, n=27, p<0.05), but if those three residences are discounted, ôdwelling areaô and wealth are no longer significantly correlated (r^2 =0.03, n=24, p=0.40), demonstrating that it is specifically the presence of extra monofunctional rooms in those wealthy residences that is responsible for the association.

which are better off financially tend to incorporate more monofunctional spaces into their residences. There is no obvious reason why the better-off groups in those communities would require their daily activities to be kept separate from one another, whilst other co-residential groups would not. Instead, we may surmise that relatively wealthy groups are the only ones able to achieve a degree of architectural segmentation aspired to by all community members.

Thus, it is clear that even within individual communities there can be variation in the degree of 'spatial dispersion'. Groups of any composition can potentially experience time restrictions, poverty, or a temporary lack of funds leading to the conflation of activities into single rooms. This suggests that differences in 'dwelling area' within communities are not always linked to the demographic make-up of the occupants, a fact which carries implications when it comes to deriving the demographic characteristics of co-residential groups from 'dwelling area'.

Variation within communities in the dimensions of individual spaces

Finer distinctions in ódwelling areaô can result from the different dimensions of the individual enclosed spaces that contribute to the measurement. Rooms are likely to be assigned their dimensions on the basis of technical and practical considerations, but also with regard to the spatial requirements of the activities and of the people they are intended to accommodate.

The sample lends support to the latter supposition. In Kireyka, huts designed to host both sleeping and cooking activities are more capacious, on average, than huts dedicated to sleeping alone;[96] this is reasonable in view of the fact that facilities for cooking and food preparation require additional space. Moreover, across a large section of the sample, there is a significant (though weak) tendency for óactual sleeping spacesô to have bigger areas when they are used by more people.[97]

Turning to technical and practical considerations, the size of a room may be constrained by the materials and techniques used to build its roof; by the need to conserve heat (cf. Hayden et al. 1996); or because the area of the plot on which the residence is set is constrained. It would be reasonable to suppose that the wealthier co-residential groups in a community would be in a better position to overcome such constraints, and to acquire materials in

[95] In Anegondi, sleeping normally occurs in multifunctional spaces. There are 15 residences equipped with special-purpose ósleeping roomsô: in 11 of those cases, the occupants are known to be well off. Four are occupied by people of ñhigh status and wealthò, whilst another seven are occupied by landowners (who are better off in Anegondi than those who practice alternative occupations).

[96] The average area of multifunctional ócooking/sleeping housesô (n=29) is $12m^2$, whereas that of ósleeping housesô (n=13) and ómenôs housesô (n=5) is $10.1m^2$.

[97] $r^2=0.17$, n=122, $p<0.001$. Since the number of people who use individual óactual sleeping spacesô is not known for every residence in the sample, only residences with a single communal dormitory (i.e. an óactual sleeping spaceô used by every member of the co-residential group) were taken into account in this calculation.

sufficient quantities to allow them to construct more capacious rooms. The only community in the sample where this theory can be tested (Baghestan), however, does not reveal a positive correlation between wealth and greater room areas.[98] The ethnographer puts the uniformity in ñmodest-sized living roomsò down to overriding concerns about heating, which are shared by all community members regardless of their wealth or their co-residential groupôs population size (Horne 1994: 159).

Summary

The composition of co-residential groups has a substantial bearing on the number of separate spaces built into residences for the performance of everyday activities; because of this, composition can be described as one of the major factors affecting the 'dwelling area' of residences.

The relationship between co-residential group composition and 'dwelling area' is not a straightforward one, however. Even within a single community, co-residential groups that have a similar composition may have to contend with different financial circumstances and so may not be equally capable of providing their residences with single-purpose rooms. They may also face different time constraints which force them to assign multiple functions to rooms that would normally have only one principal function. We should therefore not be surprised if residences endowed with relatively small ódwelling areasô sometimes accommodate quite large or complexly-structured groups.

When comparing 'dwelling areas' across different communities, additional factors come into play. Groups whose demographic characteristics are alike may live in dissimilar climates, or be enculturated with different attitudes concerning sleeping arrangements or the activities which should or should not occur in the same space. These factors could potentially impact on the design of their residences, with significant consequences on their respective ódwelling areasô.

6.5.2 Deriving co-residential group demographics from 'dwelling area'

Size

Population size appears to be responsible for about half of the variation in ódwelling areaô across the sample,[99] confirming that co-residential group demographics are significant in shaping the spaces that contribute to ódwelling areaô. However, the correlation cannot be taken to mean that groups of particular size are associated with predefined areas.

For a start, the same number of people take up less space in contexts where residents cluster

[98] r^2=0.01, n=27, p=0.57
[99] r^2=0.46, n=286, p<0.001.

together for sleeping purposes and where everyday activities spatially overlap, than in contexts where sleeping accommodation and other activities are spatially dispersed.[100] Even when these factors are kept constant, there may be different occupation densities from residence to residence. In any community, there are some residences whose sleeping accommodation is filled to capacity,[101] as well as some residences that are under-occupied due to the attrition in the membership of their co-residential groups. Inhabitants who find themselves alone or with only a few others in their residence may contract their areal usage by abandoning particular rooms,[102] but would most probably avoid the costly option of structurally downsizing their ôactual sleeping spacesõ or any other rooms that remain in use. Since ôdwelling areaõ may be filled to varying degrees, it cannot be used to deduce the precise population size of the co-residential group in occupation.

A very rough approximation of absolute population size can instead be obtained by multiplying ôdwelling areaõ by Narollõs suggested coefficient (one tenth) (Naroll 1962). Despite flaws in the method by which this was calculated (Brown 1987: 11), more often than not it provides a fair idea of the scale of a groupõs population size.[103] However, this approach is insensitive to variations in occupation density resulting from overcrowding or under-occupation, meaning that considerable errors can occur on a case-by-case basis. The approach also seems to work rather better in contexts where there is a higher degree of spatial dispersion, than in contexts where residents tend to cluster together in order to sleep, or where they sleep and cook in the same space.[104] Hence there are significant caveats associated with using Naroll's coefficient to estimate the population size of groups in communities outside of the sample.

ôDwelling areaõ may also function as an index of *relative* population size, but this too comes

[100] Baghestan, Willow Lake and Kireyka illustrate the former scenario, with average values of 4.3m^2, 4.4m^2, and 4.9m^2 ôdwelling areaõ per resident, respectively. Denpasar and Capileira are examples of the latter, with average values of 9.1m^2 and 15.7m^2 ôdwelling areaõ per resident, respectively. See Table C.1 in Appendix C for the 'dwelling area' per person value for each community.

[101] It was possible to calculate the combined area of ôactual sleeping spacesõ per residence in twelve of the communities in the sample. The lowest area/resident value in each community is not much bigger than the size of an adult laid down horizontally, suggesting that the residences in question are filled to capacity. The relevant values range from 0.9m^2 per resident (in Anegondi) to 3.4m^2 per resident (in Denpasar). Relatively low values occur in communities where sleeping takes place on bedding placed on the floor and removed during the day, whereas the five highest values occur in communities where semi-fixed installations, such as beds, mattresses or hammocks, are used.

[102] As is the case with the lone resident in P1009, a widow who sleeps in the ôliving roomõ rather than the ôparentsõ bedroomõ on the upper storey.

[103] When applied to each ôdwelling areaõ in the sample (n=286), three fifths (61%) of the estimates are either correct, or fall out by just one, two, or three people. In only 23% of cases is a population estimate wrong by more than five people.

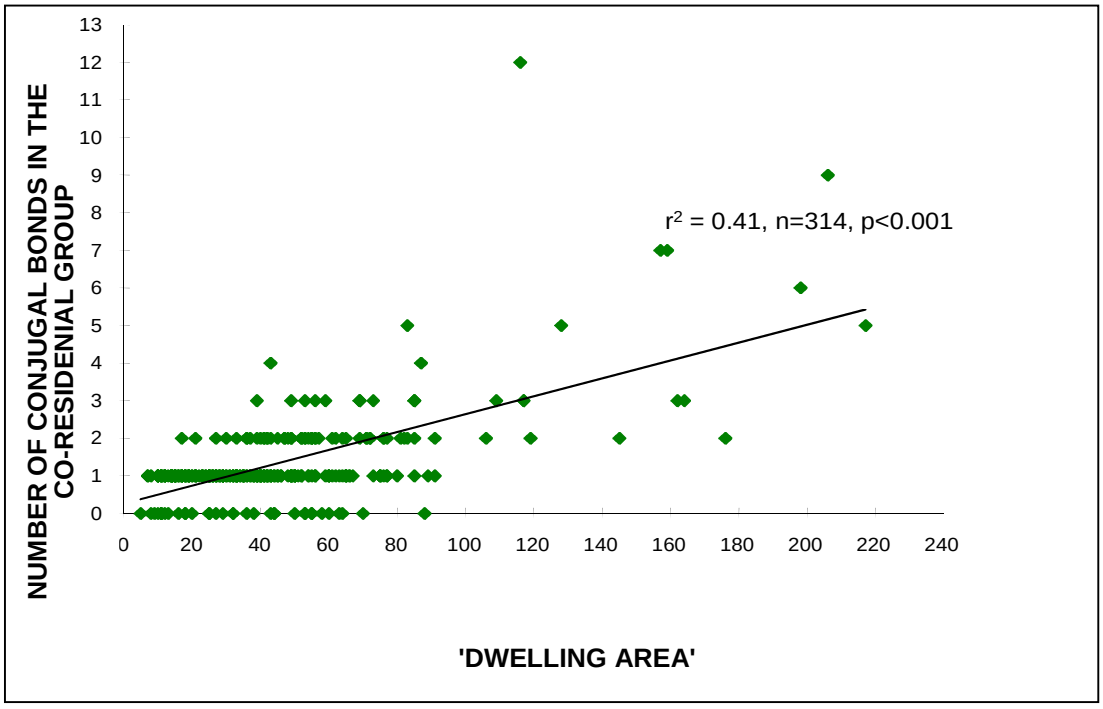
[104] For example, in 84% of cases in Aliabad, and 92% of cases in Capileira, population estimates fall out by only three or less people; by contrast, that level of accuracy is reached only 51% of the time in Xculoc, and 57% of the time in Hasanabad, where activities are spatially overlapped.

with a significant caveat. Residences equipped with a single 'actual sleeping space' diverge from the rest of the sample in that their 'dwelling areas', looked at in isolation, do not correlate with population size.[105] From this we can infer that a relationship exists between the two variables only when comparing fairly substantial differences in 'dwelling area', as is the case when residences have a dissimilar number of rooms (not just different room dimensions).

Structure

As Figure 6.3 shows, there is a moderate positive correlation between the number of conjugal bonds in the co-residential groups of the sample and the 'dwelling areas' of their residences.

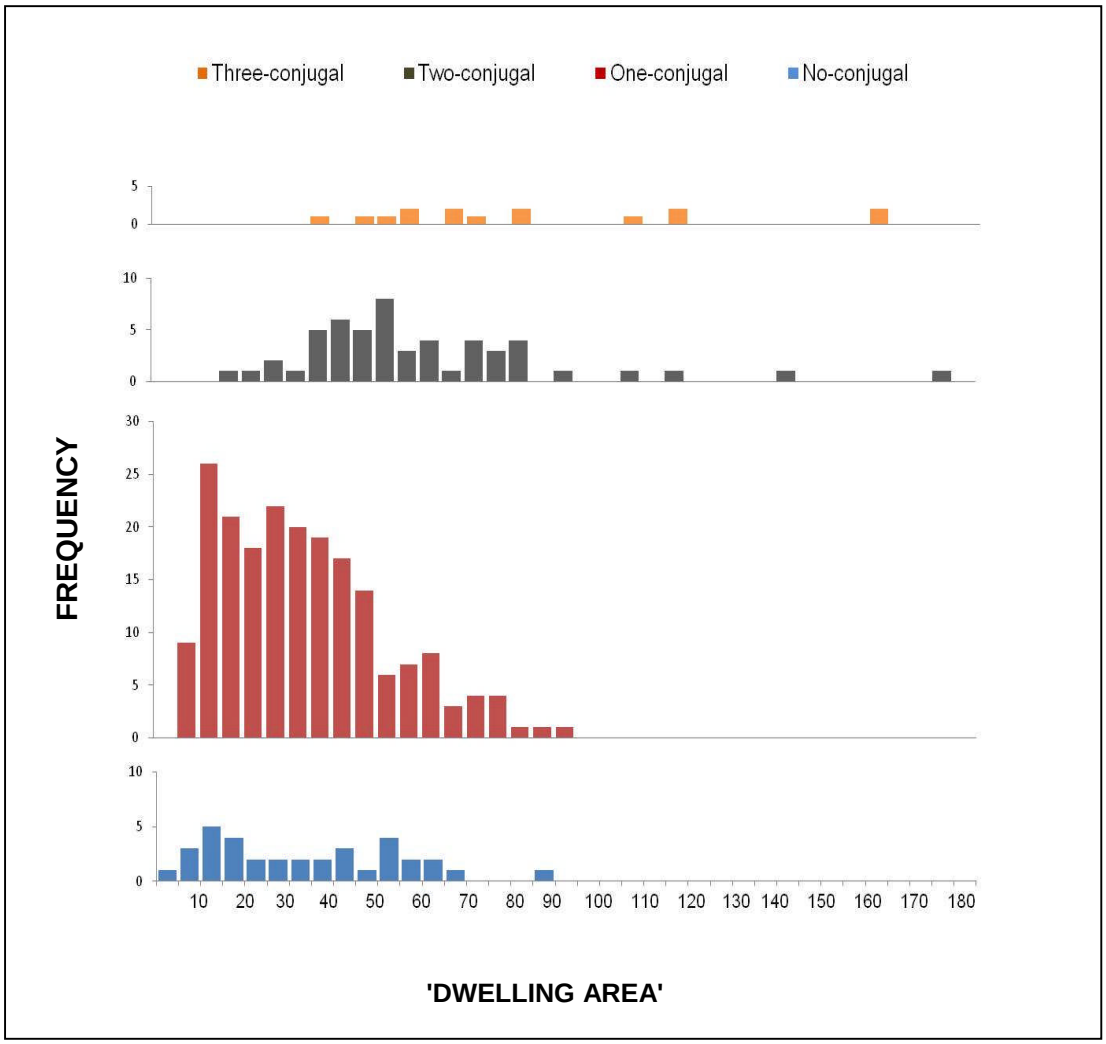
FIGURE 6.3 Relationship between 'dwelling area' and co-residential group structure



This correlation seems to be driven mostly by the large 'dwelling area' of a handful of residences occupied by groups containing two or more conjugal bonds, so it is worthwhile breaking this data down further to see how 'dwelling area' relates to less complexly structured groups. Figure 6.4 shows the distribution of 'dwelling areas' for no-conjugal, one-conjugal, two-conjugal, and three-conjugal groups separately.

[105] r^2=0.016, n=151, p=0.12

FIGURE 6.4 'Dwelling area' associated with groups of different structure



The illustration shows that no-conjugal and one-conjugal groups are associated with a similar distribution of 'dwelling areas',[106] while one-conjugal, two-conjugal and three-conjugal groups are associated with significantly different distributions to one another.[107] This is not surprising, given what we already know about sleeping accommodation amongst the communities in the sample: namely, that every couple normally requires a 'conjugal room' of its own. Thus, as the number of conjugal bonds in groups increase, so too should the number of 'actual sleeping spaces' in the residences that accommodate the groups, with concomitant increases in 'dwelling area'.

[106] The mean 'dwelling area' for no-conjugal groups (μ=34.5m^2, s.d.= 21.6, n=365) is not significantly different to the mean for one-conjugal groups (μ=34.6m^2, s.d.=18.7, n=201) using the two-sample t-test for unequal variances, t(43) =-0.04, p =0.97.

[107] The mean 'dwelling area' for one-conjugal groups (μ=34.6m^2, s.d.=18.7, n=201) is significantly smaller than the mean for two-conjugal groups (μ=60.6, s.d.=28.5, n=53) using the two-sample t-test for unequal variances, t(64) = -6.28, p <= 0.0001. The mean for two-conjugal groups (μ=60.6, s.d.=28.5, n=53) is significantly smaller than the mean for three-conjugal groups (μ=87.1, s.d.=39.0, n=15) using the two-sample t-test for unequal variances, t(18) = -2.45, p <= 0.03.

While the pattern is clear, the standard deviation associated with each type of co-residential group structure is so great that it is doubtful we could identify a group's structure on the basis of its residence's 'dwelling area'. Attention may instead be called to the fact that groups of complex structure (that is to say, groups incorporating two or more conjugal bonds) within the sample use a minimum of $20m^2$ of 'dwelling area'.[108] The probable reason for this is that $20m^2$ represents the smallest area into which it is possible to fit the two 'conjugal rooms' that are the standard prerequisite within the sample for accommodating two couples.

If we assume that the principle of one 'conjugal room' per conjugal couple can be generalised to communities outside the sample, then so too can the association between multi-conjugal occupancy and the need for at least two 'conjugal rooms' which take up a minimum of $20m^2$ 'dwelling area'. It follows that any residence whose 'dwelling area' falls below the $20m^2$ threshold is likely to accommodate a group of no-conjugal or one-conjugal structure.[109]

Residential pattern

As discussed in subsection 6.5.1, the amount of 'dwelling area' in one residence can differ to that in another on account of one or more things: unequal numbers of 'actual sleeping spaces'; unequal numbers of 'cooking spaces'; or because of the presence of multi-purpose rather than single-purpose rooms. In communities characterised by a nuclear residential pattern, we would not expect differences in 'dwelling area' between residences to be vast – perhaps only in the order of three or four rooms – since residences in those settings hardly ever contain numerous 'actual sleeping spaces' or more than one 'cooking space'. By contrast, residences belonging to communities in which a joint pattern is practised can sometimes contain high numbers of 'actual sleeping spaces' and multiple 'cooking spaces', allowing for differences of much greater magnitude. On this basis, we would expect the *overall range* of 'dwelling areas' across the residences of a community to act as an indicator of a community's residential pattern.

The sample bears this out. Figure 6.5 presents the lowest and highest 'dwelling area' values, and hence the overall range in values, for each of the communities in the sample. The range

[108] This inference is based on 78 cases from 11 communities in the sample. The single exception amongst the 78 (N1023) is in the process of expanding the 'dwelling area' of its residence by constructing another room.

[109] Unfortunately, there is no reason to believe there would be an upper limit to the amount of 'dwelling area' used by groups of simple structure. Within the sample, many no-conjugal and one-conjugal groups use more than $20m^2$ of 'dwelling area' because they have the resources to build single-purpose rooms for cooking and single-purpose rooms for other daily activities. Since affluence permits the construction of more (and possibly larger) spaces, an upper limit to the range of 'dwelling area' usage by groups of simple structure cannot be securely defined. Instead, on the basis of the present sample the tentative suggestion could be made that no-conjugal and one-conjugal groups are unlikely to use more than $100m^2$ of 'dwelling area'.

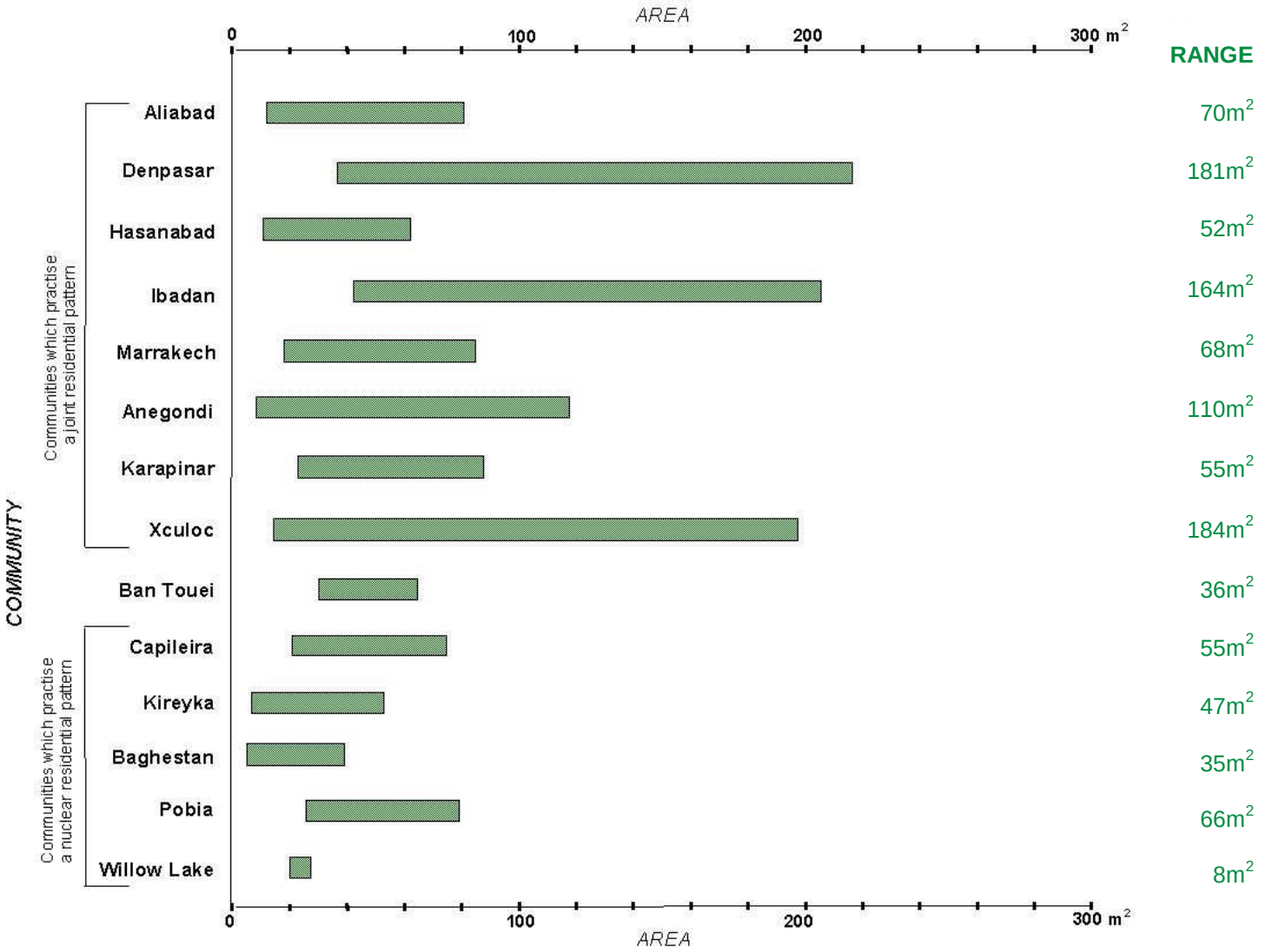


FIGURE 6.5
Distribution of 'dwelling areas' in each community in the ethnographic sample

in nine of the communities is fairly similar (between 35m^2 and 70m^2), regardless of the residential pattern practised by their inhabitants. It is notable, though, that it is only amongst communities characterised by a joint residential pattern that the range becomes exceptionally broad, reaching 100m^2 or more.[110]

6.6 'Ground-plan area'

Perhaps the most straightforward way to compare residences is by assessing how their 'ground-plan areas' measure up against one another. Intuitively, one might think that the demographic characteristics of the co-residential group intended to occupy a residence would be amongst the considerations that influence the dimensions of its ground-plan. The sample offers the opportunity to explore this assumption, and to deduce the conditions under which 'ground-plan area' most accurately reflects demographic considerations. Following this discussion, we investigate whether 'ground-plan area' is useful in identifying a) co-residential group population, b) co-residential group structure, and c) the residential pattern operating in a community.

6.6.1 Regularities and differences in ' ground-plan areas' within and across cultures

Residences are commonly designed with spaces dedicated to economic and ritual activities or to storage, and often incorporate some unroofed areas as well as spaces which facilitate circulation. The 'ground-plan area' of any single-storey residence consists of the combination of its 'dwelling area' and the amount of space given over to such uses (its 'non-dwelling area').

A key reason why communities may have substantial differences in the 'ground-plan area' of their residences comes down to the 'non-dwelling area' they incorporate. This is apparent from the sample: 'ground-plan areas' are small in communities where inhabitants do not practise their occupations or store large amounts of their possessions within their residences, and larger in communities whose inhabitants carry out their economic activities and storage

[110] Of course even in communities characterised by a joint residential pattern residences may differ only by a small number of spaces, so that the range in a community's 'dwelling area' may be fairly modest.

in courtyards, stables, and storerooms within their residences.[111]

'Ground-plan areas' may also differ *within* individual communities. There are numerous reasons why this might happen, some of which are closely tied up with the demographic characteristics of the occupants. However the size of ground-plans may also differ for financial and other circumstantial reasons, irrespective of the demographic make-up of the occupants. All these reasons are considered below.

Variation within communities in the spatial requirements of co-residential groups

In communities where there are few or no restrictions on the construction of residences, we would expect inhabitants to construct and modify the dimensions of their residences to suit their spatial needs. 'Ground-plan areas' should expand or contract to suit the occupants' requirements for economic activity areas and storerooms, which themselves often change during the lifetime of the co-residential group's head.

This appears to be the case in two of the communities in the sample, Baghestan and Kireyka. In both communities, co-residential groups whose heads are middle-aged and whose ranks are swollen by unmarried children tend to occupy residences with the most economic activity areas and storerooms. In the early years of their marriage, heads have little opportunity or need to incorporate such spaces in their new residences (or, in the case of Baghestan, to construct the courtyard wall that binds everything together), but, as their assets grow and their children become adolescents, they gradually make these additions (Horne 1994: 170; Tobert 1988: 163). During that time, they may also build extra 'actual sleeping spaces' to accommodate their growing families, or acquire sufficient funds to build single-purpose rooms for some of their everyday activities (e.g. cooking), thus increasing their residences' 'dwelling area'.[112] Thereafter, residences are once again downsized by 'empty-nesters', who, in Baghestan, allocate portions of their residential property to their children when they marry (Horne 1994: 188), and, in Kireyka, reduce the perimeter of their compound walls as soon as their children leave (Tobert 1988: 165).[113]

---

[111] In only three of the communities in the sample (Willow Lake, Ban Touei, and Capileira) do residences consistently have little or no unroofed areas or rooms dedicated to animal-keeping or craft activities, because their residents work and store their goods elsewhere. Their average 'ground-plan areas' range from 28m^2 to 87m^2. By contrast, the values from the rest of the sample range from 180m^2 (in Marrakech) to 276m^2 (in Kireyka), with considerably higher values for Denpasar and Xculoc. See Table C.1 in Appendix C for the average 'ground-plan area' in each community.

[112] A general trend linking 'non-dwelling area' with 'dwelling area' can be found in Baghestan (r^2=0.17, n=29, $p<0.05$) and in Kireyka (r^2=0.83, n=28, $p<0.001$), suggesting that large 'ground-plan areas' result from concomitant rises in both types of space.

[113] In Baghestan, mean 'ground-plan area' is 227m^2 for residences whose heads are in their 30s and 40s (n=13), and only 122m^2 for residences whose heads are in their 50s and 60s (n=9). In Kireyka, mean 'ground-plan area' is 376m^2 for residences whose heads are married with teenage offspring (n=8), and only 246m^2 for residences whose heads are older women with absent mature offspring (n=5).

The low cost and ready availability of land and of construction materials for residences make it relatively easy for residents in these two communities to modify their residences as and when required. As a result, extension and contraction episodes tend to occur in tandem with membership growth and reduction, respectively. This is reflected in the moderately strong correlation between 'ground-plan area' and population size in those two communities.[114]

Variation within communities in the ability to build large ground-plans

Even within Baghestan and Kireyka, however, some 'ground-plan areas' do not reflect the life-cycle stage of the head and the composition of the group's members. The reason for this is that even in communities where there are plenty of building sites available, residents are not always free to build residences with extensive ground-plans.

If regions of high building density develop, only small gaps may be available for new construction. In such situations, new construction may be confined to the community's outskirts where land is still be plentiful, but any residences that continue to be built in areas of architectural congestion tend to be given much smaller dimensions than their neighbours. A case in point is residence K1028 in Kireyka, which had to be fitted in between five pre-existing structures and consequently has one of the smallest 'ground-plan areas' in that community.[115] The filling in of gaps simultaneously impacts the older residences in the region, by boxing them in and curtailing their potential for extension.

The dimensions of individual ground-plans may also be constrained in communities where building plots have monetary value rather than being freely available. Where land prices exist, wealthier co-residential groups have the advantage in being able to buy up large ready-made residences or additional land for their residences as needed, whereas groups that are less well off financially have to make do with smaller plots (unless they happen to inherit more land). The sample unfortunately cannot confirm this, because the only figures available on co-residential group wealth refer to the time when residences were recorded, not the time when they were being built.[116]

Variation within communities in the ability to modify ground-plans

The relative freedom with which the residents of Baghestan and Kireya can modify the boundaries of their residences accounts for the fairly clear association between 'ground plan

[114] In Baghestan: $r^2=0.40$, $n=28$, $p<0.001$; in Kireyka: $r^2=0.36$, $n=28$, $p<0.001$.
[115] K1028 is eight years old, but its closest neighbours are all over ten years old (except K1030, which does, however, contain within its boundary a 16-year-old compound which is located immediately next to K1028).
[116] Perhaps for this reason wealth does not correlate with 'ground-plan area' amongst the residences in Aliabad that were constructed by their current occupants ($r^2=0.06$, $n=20$, $p=0.31$).

area' and the demographic composition of groups in those two communities. Most of the communities in the sample do not have the same degree of freedom to modify their residential boundaries. For this reason, 'ground-plan area' in most of the sampled communities does not correlate to the demographic characteristics of the inhabitants.[117]

In some communities, there may be structural reasons or legal restrictions (e.g. planning regulations) that prevent residential boundaries from being modified.[118] Moreover, boundaries may be modified for reasons that have nothing to do with changes in population membership. For example, one possible reason for extending a residential boundary which is completely unrelated to the demographics of the group is that extension may be seen as a financial enterprise. Wherever there is a real estate market, affluent co-residential groups may wish to invest their capital in residential property and simultaneously display their wealth through their residences. To that end, they may extend the ground-plans of their residences by buying up those of their neighbours and amalgamating them with their own. Residences C1033 and C1054 in Capileira, for example, were formed in this way (Delaigue 1988: 117). It is likely that the substantial gains in 'ground-plan area' in these cases were financially motivated, and achieved with little or no regard for, or effect on, the composition of the co-residential groups in occupation.[119]

Residential boundaries may also be contracted for financial reasons. In communities where there is a market for real estate, the sale or rent of a portion of an under-occupied residence may be a means of raising capital, as it is in Marrakech (Schwerdtfeger 1982: 282). However, in contrast to extension, the contraction of ground-plans tends to be contingent upon demographic changes amongst the occupants. Subdivision usually occurs after attrition in the co-residential group's membership has taken place, as mentioned in connection with Baghestan. Alternatively, the members of a co-residential group may decide to split into sub-

[117] Once Baghestan and Kireyka are removed from consideration, only four of the remaining 12 communities in the sample show any significant correlations between 'ground-plan area' and co-residential group demographics (size or structure). The four communities are: Aliabad, Capileira, Hasanabad and Anegondi.

[118] In Ban Touei, for example, residences retain their dimensions throughout their use-life, and are passed on intact to the heir of the co-residential group's head. Notably, because these residences are built on stilts, they are not amenable to subdivision in the same way as, say, the courtyard houses of Aliabad.

[119] Unfortunately the ethnographer does not report on the intentions of the buyers in these two cases, or the financial circumstances and composition of the co-residential groups occupying the residences before and directly after the purchases were made. That said, it is unlikely that ground-plan amalgamation in this context would be justified on demographic grounds alone, since any given co-residential group in Capileira has fairly consistent spatial requirements over time, and so has little *need* for the extra space. A group's demand for 'dwelling area' may fluctuate during the head's lifetime as his family grows, but not by much, since the community is characterised by a nuclear residential pattern; moreover, residents tend not to practise their occupations or store large amounts of goods within residences, so there is little call for variation in 'non-dwelling area' as the group's membership changes.

groups, and subdivide the residence amongst them: on these occasions, the loss in 'ground-plan area' from the original residence goes hand-in-hand with a decrease in the population size and structural complexity of the original co-residential group.

Once a loss of 'ground-plan area' has been effectuated it is rare to recoup the lost space, even if the residents' membership later builds up again with concomitant increases in their spatial requirements. This puts the occupants of subdivided residences at a particular disadvantage in communities which practise a joint residential pattern. Each new residence formed through subdivision in such a community accommodates, within its diminished 'ground-plan area', a co-residential group which is on a natural course towards expansion. As a consequence it is possible that, following subdivision, fairly populous or complex groups may develop in residences with modest 'ground-plan areas'. This may explain why there is only a weak or insignificant association between 'ground-plan area' and co-residential group demographics in the sampled communities characterised by a joint residential pattern.[120]

One might wonder how co-residential groups cope with not being able to adjust their 'ground-plan area' to suit their composition. In fact there are plenty of ways of coping with such restrictions, and great tolerance shown by co-residential groups for small 'ground-plan areas'. If a group requires more 'dwelling area' than it currently has, it can add the spaces it needs within the predefined limits of the residence by encroaching on any 'non-dwelling area', relocating economic activity spaces elsewhere if necessary.[121] When the point is reached where all available room at ground level has been used up, or the occupants are not willing to sacrifice any more 'non-dwelling area', more spaces may be added on an upper storey (assuming that the residence has the structural capability to support it). Occupants may even extend an upper storey over the ground floor of an adjoining residence (as in M1045 in Marrakech), or create a suspended extension over a public road (as in C1034 in Capileira). If the co-residential group can still not fit itself into a given 'ground-plan area' satisfactorily after all such options have been exhausted, then it must either stay in its residence but expel some of its members, or abandon its residence altogether and move into a more suitable one.

[120] The only correlations that are significant are also quite weak: in Aliabad (relationship with population size: $r^2=0.29$, $n=67$, $p<0.001$; relationship with number of conjugal couples: $r^2=0.11$, $n=67$, $p<0.01$); in Anegondi (relationship with population size: $r^2=0.16$, $n=47$, $p<0.01$; relationship with number of conjugal couples: $r^2=0.23$, $n=47$, $p<0.001$); and in Hasanabad (relationship with number of conjugal couples: $r^2=0.22$, $n=32$, $p<0.01$).

[121] Schwerdtfeger's account of the history of I1005 in Ibadan, for example, describes a forty-year-long process in which the courtyard was gradually filled in with 'actual sleeping spaces' to accommodate the growing number of occupants (Schwerdtfeger 1982: 144-5).

Summary

In communities where construction materials are inexpensive and land abundant and easy to acquire, demographic considerations are deliberately factored in to shaping the ground-plan of residences. Extension and contraction episodes tend to occur in tandem with growth and reduction in the membership of co-residential groups. Even within such communities, however, residential boundaries may not always be as large as desired due to constraints on space.

The ability to modify the 'ground-plan area' of a residence is restricted in communities where land and materials are not easy to come by, or where modification is subject to legal restrictions (e.g. planning regulations) or structural constraints. Co-residential groups which do not have the opportunity to acquire a large piece of land for construction; who lack the funds to extend the boundaries of their residence by buying up an adjacent residence or empty plot; or who are denied permission or the structural potential to extend their residence, have little choice but to find ways of fitting whatever spaces they need as best as they can into a small piece of land.

In communities whose inhabitants do not have the luxury of being able to build or adjust the boundaries of their residences as they please, 'ground-plan areas' will vary mainly as the result of factors that are unrelated to the demographics of the group: namely, uneven constraints on space, and economic disparities between co-residential groups. In these situations the 'ground-plan areas' of residences would likely reflect spatial and financial circumstances as much as, or even more than, the demographic composition of co-residential groups.

It was also noted above that constraints on space become aggravated in areas of architectural congestion, and particularly amongst residences that have previously undergone subdivision and are boxed in by their neighbours. This has further significant implications for the way we interpret differences in 'ground-plan area', since, somewhat counter-intuitively, residences whose ground-plans have modest dimensions may end up accommodating co-residential groups with large populations or complex structures. Meanwhile, residences built in areas where there is plenty of space for construction, or which have undergone few episodes of subdivision, may have relatively large 'ground-plan areas', regardless of the composition of their co-residential groups.

6.6.2 Deriving co-residential group demographics from 'ground-plan area'

Size

The sample suggests that 'ground-plan area' tends to be attuned to co-residential group population size in settings where there are few financial, legal, structural and spatial barriers to the modification of residential boundaries, as in Baghestan and Kireyka. Though 'ground-plan areas' cannot be used to derive *absolute* population size,[122] in such settings they can be indicative of *relative* population size: residences with larger 'ground-plan areas' would likely accommodate larger populations that residences with smaller 'ground-plan areas'.

Elsewhere, residents face a host of restrictions which can prevent them from modifying their residence's boundaries and mean they have to make do with ground-plans which may not be as spacious as they would like. Since co-residential groups are adept at finding ways of fitting the space they need for their everyday living into a predefined area, even residences whose 'ground-plan areas' make them appear cramped can sometimes have numerous occupants. Thus, there is often a mismatch between 'ground-plan area' and population size. This mismatch is reflected in the fact that the two variables are not significantly correlated across the sample as a whole.[123]

Even within settings where inhabitants face restrictions in modifying the boundaries of their residences it may be feasible to infer the *relative* population size of co-residential groups, depending on how their residences are designed. The sample suggests that residences are sometimes designed in such a way that their 'ground-plan areas' provide a fairly good approximation of their 'dwelling areas'. Where this is the case, 'ground-plan area' tends to correlate with population size.

- 'Ground-plan area' and 'dwelling area' are better matched in residences designed with a single storey than in residences designed with multiple storeys; hence, the correlation between 'ground-plan area' and population size is stronger amongst single-storey residences.[124]
- 'Ground-plan area' can sometimes provide a reasonably good approximation of 'dwelling area' even in multiple-storey residences, as long as every living space is

[122] The application of Naroll's coefficient on 'ground-plan area' is likely to over-estimate population size. This is true of 93% of residences in Baghestan and 100% of residences in Kireyka. Across the sample as a whole, this method over-estimates population in 89% of the residences where population size is known. The only exception to this pattern is in the one-room log cabins of Willow Lake, where this method tends to underestimate population size.

[123] $r^2=0.01$, n=337, p=0.07.

[124] In Aliabad, for example, there is a correlation between 'dwelling area' and 'ground-plan area' in single storey residences ($r^2=0.21$, n=27, $p<0.02$) but not in multiple storey residences. Accordingly, single-storey residences show a better correlation with population size ($r^2=0.45$, n=36, $p<0.001$) than do multiple-storey residences ($r^2=0.21$, n=31, $p<0.05$).

confined to only one of the available storeys and the living spaces take up the entire residence 'footprint'. In such cases, there may be a significant correlation between ground-plan area' and co-residential group population size.[125]

- 'Ground-plan area' also provides a good approximation of 'dwelling area' where a residence contains small amounts of 'non-dwelling area' (e.g. small amounts of unroofed space and few or no rooms dedicated to storage or economic activities).[126]

In situations where 'ground-plan area' can serve as a good proxy for 'dwelling area', a pattern can be seen whereby residences with the largest ground-plans tend to be occupied by co-residential groups that are amongst the most populous in the community, while those with the smallest ground-plans are occupied by relatively small groups. It should be borne in mind, however, that this pattern can sometimes be undermined by instances of over-crowding or under-occupation.[127]

Within the sample, more often than not the relationship between 'ground-plan area' and 'dwelling area' is very weak.[128] In these situations, relative population size cannot be derived from 'ground-plan areas'.[129] Comparing the 'ground-plan areas' of two residences from the same community usually tells us about differences in the spatial circumstances under which

[125] In the multiple-storey residences of Capileira, for instance, where all 'dwelling area' is located on a single storey and any storerooms or stables are tucked away beneath it, there is a fairly strong correlation between 'ground-plan area' and 'dwelling area' (r^2=0.61, n=12, p<0.01). Accordingly, there is a significant (though modest) correlation between 'ground-plan area' and population size in Capileira (r^2=0.33, n=12, p<0.05). By contrast, in the multiple-storey residences of Marrakech, each storey contains a mixture of both 'dwelling area' and 'non-dwelling area'; accordingly, there is no significant association between 'ground-plan area' and population size amongst the multiple-storey residences of Marrakech (r^2=0.11, n=10, p=0.34).

[126] In Ibadan, for example, there is a moderate correlation between 'dwelling area' and 'ground-plan area' (r^2=0.52, n=10, p<0.02). On this occasion, this does not translate into an association between 'ground-plan area' and population size because so many of the sampled residences from Ibadan are overcrowded (r^2=0.25, n=10, p=0.14).

[127] Hence, in both Capileira and Ibadan there are residences with modest 'ground-plan areas' which accommodate as many or more people than the residences with the largest 'ground-plan areas'.

[128] Twelve of the 14 communities show some degree of correlation between 'ground-plan area' and 'dwelling area', but the weakness of this relationship is apparent when looking at the sample as a whole (r^2=0.03, n=312, p<0.01). There is no correlation at all between the two spatial attributes in Pobia and Xculoc, where residences tend to contain variable, and often extensive, amounts of 'non-dwelling area'.

[129] An exception to this is when there has been an episode of residential subdivision. Some of the evidence from the sample suggests that when residences are subdivided, more populous subgroups of the original co-residential group tend to be allocated larger portions of the residence (e.g. A1054 and A1057, A1020 and A1033, A1048 and A1049, and X1009 and X1010, which resulted from episodes of subdivision five years ago, three years ago, ten years ago, and less than ten years ago respectively). Hence, the various residential populations and ground-plans resulting from a particular episode of subdivision are proportionately sized in relation to each other (although not necessarily to the rest of the residences in the community). It should be noted that the reciprocal relation between 'ground-plan area' and population size arising from such situations may not last for long, as the membership of each of the new co-residential groups inevitably changes with time. This may explain why in Xculoc the relative 'ground-plan areas' of residences X1015, X1019, X1014, X118S and X118N, which resulted from the subdivision of a single residence more than twenty years ago, do not reflect the relative population sizes of the groups they currently accommodate.

their residences were built, instead of giving us any demographic information.[130]

Structure

As we would expect from the discussion so far, the correlation between 'ground-plan area' and the number of conjugal couples in the co-residential group is significant in some of the sampled communities but not others, depending on the degree of freedom the inhabitants have in adjusting the boundaries of their residences to suit their composition.[131] The existence of a significant correlation, however, is not necessarily helpful in trying to derive co-residential group structure from 'ground-plan area'.[132]

Instead, it is helpful to recall from subsection 6.5.2 that 'dwelling areas' of less than $20m^2$ are unlikely to fit the two or more 'conjugal rooms' needed for multi-conjugal occupancy. If a residence's ground-plan is below $20m^2$ in area, and its 'ground-plan area' can reasonably be assumed to offer a good approximation of its 'dwelling area', then that residence is unlikely to accommodate a group of complex structure.[133]

Residential pattern

Figure 6.6 shows the range of 'ground-plan areas' in each of the 14 communities in the sample. The range is remarkably alike for most of the communities, regardless of the residential pattern practised by the inhabitants. In all communities apart from Xculoc and Denpasar, the smallest 50% of values falls within a modest $150m^2$ range of each other.

Xculoc and Denpasar are characterised by exceptionally large ranges, but there is no reason to attribute this to the practice of a joint residential pattern in those communities. Instead, the differences in the 'ground-plan areas' of their residences arise from uneven constraints on

[130] This can be demonstrated in Aliabad. Sixteen of the residences on the outskirts of Aliabad have conspicuously larger and more rectilinear ground-plans than most other residences in the community ($356m^2$ 'ground-plan area' on average, as opposed to $220m^2$ for other residences). This has nothing to do with the composition of the groups that occupy them. The 16 residences were built more recently (average age is only 12 years) and so have generally undergone fewer episodes of subdivision than other residences; in addition, they have not been subject to the spatial constraints associated with regions of higher building density.

[131] The strongest correlations are in Kireyka ($r^2=0.48$, $n=28$, $p<0.001$) and Baghestan ($r^2=0.37$, $n=29$, $p<0.001$), but weaker correlations that are also significant exist in Anegondi ($r^2=0.23$, $n=47$, $p<0.001$), Hasanabad ($r^2=0.22$, $n=32$, $p<0.01$) and Aliabad ($r^2=0.11$, $n=67$, $p<0.01$). Over the sample as a whole the association between 'ground-plan area' and number of conjugal couples is not significant ($r^2=0.005$, $n=363$, $p=0.16$).

[132] For instance, the range of 'ground-plan areas' associated with one-conjugal groups in Hasanabad is no different from the range of 'ground-plan areas' associated with two-conjugal groups using the two-sample t-test for unequal variances, $t(5) = -1.06$, $p = 0.34$. The equivalent calculations in Aliabad and Anegondi showed differences that were barely significant at the 90% level.

[133] One might even suggest that 'ground-plan area' should be at least $30m^2$ or so before it becomes suitable for multi-conjugal occupancy, in order to take into account the thickness of walls and any transitional spaces separating the enclosed spaces within the $20m^2$ of 'dwelling area'. In fact, even $30m^2$ is a very conservative figure: there are no co-residential groups of complex structure in the sample which use two 'conjugal rooms' and have any less than $84m^2$ 'ground-plan area' in their residences.

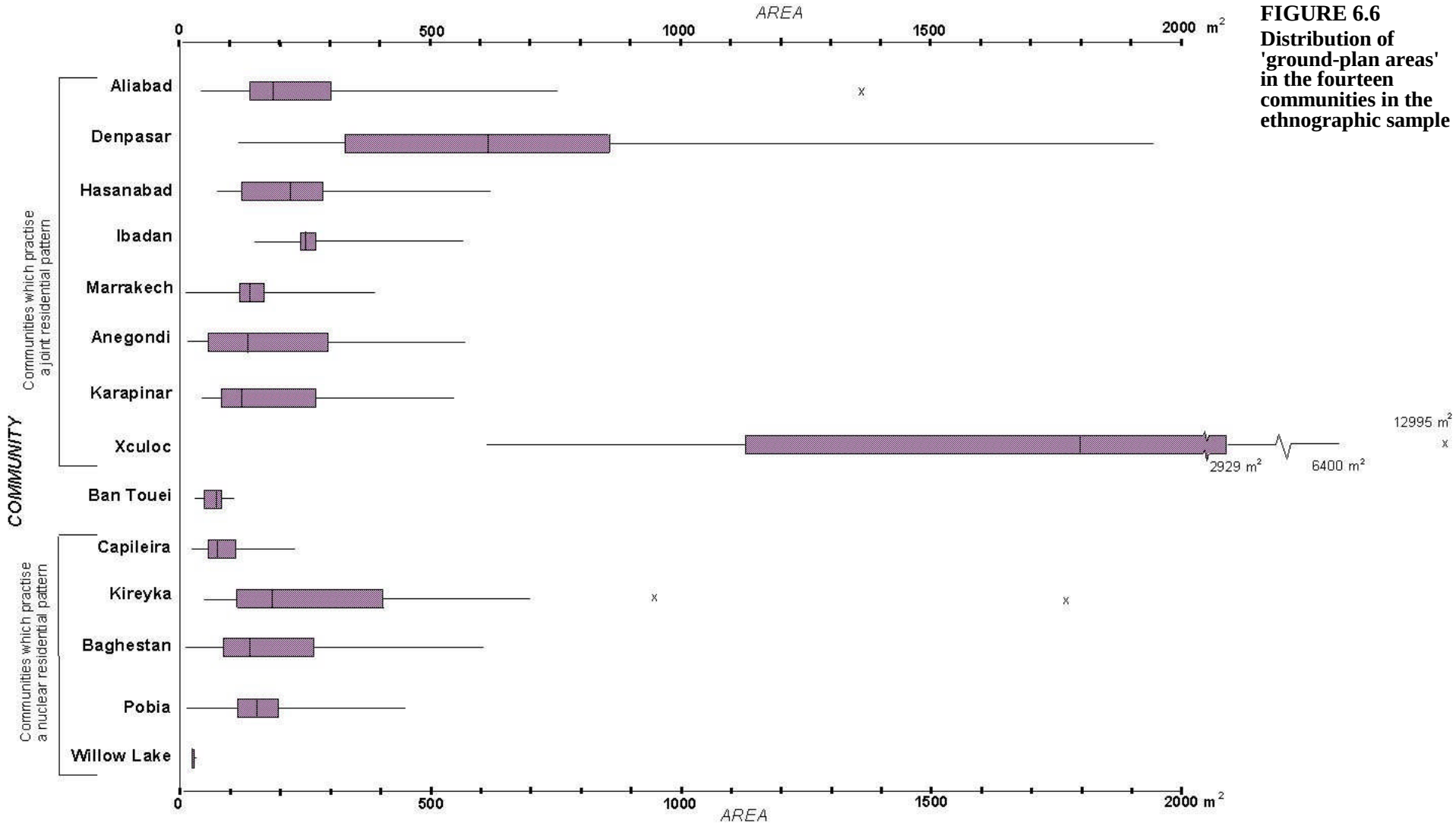


FIGURE 6.6
Distribution of 'ground-plan areas' in the fourteen communities in the ethnographic sample

space. In Xculoc, the largest ‘ground-plan areas’ can be found at the north-eastern edge of the community where land for construction is plentiful, whilst most of the smallest are in residences that have experienced subdivision and are boxed in by their neighbours or by public areas upon which they cannot encroach. Similarly, in Denpasar the largest ‘ground-plan areas’ are associated with residences of the traditional style, which were mostly built before the community became congested with buildings, while the smallest ground-plans belong to recently-constructed residences in the densely built-up city centre.

Willow Lake, Ban Touei, and Capileira have the narrowest ranges in ‘ground-plan area’. Once again, this has little to do with the demographic characteristics of their occupants. What these communities have in common is that their inhabitants carry out their occupations, store their agricultural produce, and shelter their livestock outside their residences, so that there is a near absence of 'non-dwelling area’ within their residences. This, and the absence of unroofed areas within the residences, limits the potential scope of variation in their ‘ground-plan areas’.

The above suggests that the residential pattern practised by inhabitants plays no role in determining the range of ‘ground-plan areas’ in a community. Within the sample, ‘ground-plan areas’ do not indicate whether a community practises a nuclear, stem or joint pattern.

6.7 Conclusion

One of the three key objectives of this research has been to determine whether basic demographic characteristics of co-residential groups can be inferred from the spatial attributes of their residences. The ethnographic sample has given us the opportunity to investigate how members of co-residential groups use space in their residences, and whether they do so in similar ways within and across cultures. Having done this, we can conclude that it is indeed possible to derive information about the size and structure of the sampled co-residential groups and the residential patterns practised by the sampled communities on the basis of residence room counts and areal measurements.

What is less clear is whether we can generalise what we have learnt from the sampled communities to other communities. It is worth reiterating that the sample does not constitute a representative microcosm of the world's co-residential groups, or reflect all possible variations in housing. Because of this, we cannot assume that the patterns apparent in the sample would necessarily apply elsewhere. Although the sample gave us glimpses of trends and statistical patterns of association, its value lay mainly in stimulating theoretical discussion about why an association should exist at all, and why it might not under different circumstances. It is these understandings, rather than any statistical findings, that are most clearly transferable to other contexts.

The most important learning point from the investigation has been that the composition of the co-residential group occupying a residence is not the only determinant of room counts and areal measurements. The spatial attributes of residences are also contingent on a range of non-demographic factors. Table 6.4 summarises the practical, financial, cultural, contextual and design-related factors that were mentioned in different sections of Chapter 6 as having a potential influence on room counts and areas. When looking at a residence, this table should prompt us to consider whether its room counts, 'dwelling area' and 'ground-plan area' might have been shaped by factors unrelated to the demographic make-up of the occupants. Only *after* the impact of non-demographic factors has been given due consideration is it valid to use the spatial attributes of residences to derive demographic information about co-residential groups.

TABLE 6.4 Non-demographic factors which can influence room counts and areal measurements

Factor		Potential effect	Influence on room counts			Influence on areas	
			Actual sleeping spaces	Formal sleeping spaces	Cooking spaces	Dwelling area	Ground-plan area
Practical	High construction costs	o Restricts the ability to provide special-purpose rooms and additional sleeping accommodation as needed. o Discourages structural downsizing, e.g. elimination of unused sleeping accommodation (hence may be associated with under-occupation)	✓	✓		✓	
	Short intended period of occupation	o Increases the residents' tolerance levels for using single spaces for multiple functions, or sharing sleeping accommodation.	✓	✓		✓	
	Early stage in construction process	o Increases the residents' tolerance levels for using single spaces for multiple functions, or sharing sleeping accommodation.	✓	✓		✓	
	High heating requirements	o May encourage residents who normally sleep apart to sleep together.	✓			✓	
	Other structural considerations (e.g. nature of construction materials, their availability or durability)	o May restrict the ability to build rooms with large dimensions. o May restrict or discourage modification of residential boundaries as needed.				✓	✓
Financial	Affluence	o Increases ability to acquire large building plots and extend residential boundaries as needed. o Increases the ability to provide special-purpose rooms and separate accommodation for individual group members and guests. o May increase demand for sleeping accommodation (for live-in assistants).	✓	✓	✓	✓	✓
	Shortage of funds	o Restricts the ability to provide sufficient sleeping accommodation for residents (hence may be associated with overcrowding). o Increases tolerance for using single spaces for multiple functions, especially on a provisional basis. o Restricts the ability to acquire large building plots or extend residential boundaries as needed.	✓	✓	✓	✓	✓

Factor		Potential effect	Influence on room counts			Influence on areas	
			Actual sleeping spaces	Formal sleeping spaces	Cooking spaces	Dwelling area	Ground-plan area
Cultural	Attitude to privacy, independence, and physical closeness	o Affects the residents' tolerance levels for sharing sleeping accommodation or cooking facilities.	✓	✓	✓	✓	
	Certain activities perceived as 'polluting'	o May increase demand for special-purpose spaces		✓	✓	✓	
Contextual	Existence of planning regulations or other legal restrictions to residence modification	o Restricts the ability to modify residential boundaries as needed.					✓
	Existence of real estate market	o Encourages the extension of residential boundaries for financial reasons (e.g. buying up a neighbouring plot, or amalgamating adjacent ground-plans). o Encourages structural subdivision and the sale or rent of portions of residences for financial gain. o May encourage the acquisition or construction of extra rooms to add value or attract sales.		✓			✓
	Location in region of high building density	o Restricts the ability to acquire large building plots or extend residential boundaries as needed.					✓
Design-related	Structural potential for supporting multiple storeys	o Increases ability to provide special-purpose rooms and additional sleeping accommodation without extending the boundaries of residences.	✓	✓	✓	✓	
	Modest amounts of non-dwelling spaces (e.g. unroofed space, storage space, spaces for practising occupations, or specialised spaces for entertaining guests)	o Restricts the potential size of ground-plans.					✓
	Presence of spare sleeping accommodation (e.g. designed for guests, for a more populous co-residential group previously in occupation, or to meet the future needs of the current occupants)	o May encourage residents who normally sleep together to sleep apart.	✓	✓		✓	

So, once the effects of non-demographic factors on the four spatial variables have been accounted for, what can the variables tell us about co-residential group demographics? When considering the sampled communities, they were able to give us a rough idea of the absolute population size, the relative population size, and the structure of co-residential groups, and in a few cases could point towards the residential pattern practised by a community. If we wished to derive the same type of information from non-sampled communities, we would need to assume that certain patterns within the sample also held true more widely, namely:

- that at least some members of every co-residential group normally cluster together for sleeping purposes;
- that a key priority when sleeping accommodation is allocated to residents is to ensure that every conjugal couple has its own 'conjugal room', and that such rooms would normally be situated in such a way that one never provides the only means of access to another; and
- that separate cooking spaces are only required when a residence needs to cater to the needs of co-residential group members who are unrelated to the head or to multiple conjugal couples.

With these assumptions in place, it is possible to derive the following:

1) Absolute population of co-residential groups

Because residents normally cluster together to some extent for sleeping purposes, the number of 'actual sleeping spaces' in a residence would likely underestimate a group's population size. We can get a gross approximation of population size by multiplying the residence's 'dwelling area' with Naroll's coefficient (one tenth), but even after the influence of non-demographic factors on 'dwelling area' have been taken into account, individual estimates may be considerably off the mark due to overcrowding or under-occupation.

2) Relative population size of co-residential groups

On balance, a co-residential group is likely to have more members than another group belonging to the same community if its residence has a higher 'actual sleeping space' count. Extreme differences in 'dwelling area' are also indicative of differences in population size. In situations where the 'ground-plan areas' of residences form a good proxy for their 'dwelling areas', residences with the largest ground-plans are likely to accommodate co-residential groups that are amongst the most populous in the community, while those with the smallest ground-plans are likely to accommodate relatively small groups.

3) Structure of co-residential groups

The possibility of multi-conjugal occupancy can be assessed by counting how many independently located ‘formal sleeping spaces’ a residence contains: there must be two or more such spaces in order to accommodate each of the couples in the group with an appropriate standard of privacy. Since at least two ‘conjugal rooms’ are required to accommodate groups of complex structure, a residence with less than $20m^2$ of ‘dwelling area’ is likely to accommodate a group of simple structure, consisting of just one conjugal couple or no conjugal couples. The same can be said of any residence with a ground-plan that is less than $20m^2$ in area, as long as its 'ground-plan area' can reasonably be assumed to offer a good approximation of its 'dwelling area'. Co-residential groups are also likely to be complex in structure if a residence contains more than one ‘cooking space’; however this could instead be indicative of membership within the co-residential group of persons who are unrelated to the head.

4) Residential pattern of communities

In communities where residences are uniformly equipped with a single ‘actual sleeping space’, a nuclear residential pattern is likely to be practised. On the other hand, if a community includes residences which span a very broad range of ‘dwelling areas’, or residences with ‘actual sleeping space’ counts of five or more whose occupants cannot be shown to be affluent, we can cautiously infer the practice of a joint residential pattern.

Part III:

The Archaeological Record

CHAPTER 7
Co-residential groups and residences in the archaeological record

7.1 Introduction

Part III of this thesis turns from present-day to ancient housing. Here we explore whether it is possible to deduce the demographic characteristics of co-residential groups from the plans of archaeologically excavated residences.

Domestic architectural remains and their contents are amongst the most common finds on archaeological sites. The social information derived from them usually has to do with the occupants' wealth, the economic activities they engaged in, and their consumption patterns (e.g. Santley and Hirth (Eds.) 1993; Allison (Ed.) 1999), yet surprisingly little attention is paid to the occupants' demographic composition. As a result, we often lack a clear picture of the social groups associated with individual residences. Part III investigates whether that picture can be brought into sharper focus.

Chapter 7 presents and critiques approaches used by archaeologists to infer the demographic characteristics of the occupants of ancient residences. Section 7.2 discusses how co-residential group composition is normally approached in archaeology, and section 7.3 fleshes out the discussion by reviewing four archaeological studies that address this issue. Two additional case studies, one by Wallace-Hadrill (1994) and the other by Schloen (2001), are reviewed in much greater detail in section 7.4 and section 7.5. In each case, an assessment is made of the method the author has used to deduce demographic information about the inhabitants of excavated residences, in light of the ethnographic investigation in Chapter 6; then, a fresh look is taken at some of the available evidence from that context, to determine the feasibility of reconstructing co-residential group demographics. The chapter concludes by reflecting on the value of the ethnographic insights for interpreting the archaeological remains of residences, and the difficulties in applying these insights to the archaeological record. These difficulties are considered more closely in the case of Bronze Age Cyprus in Chapter 8.

7.2 Common approaches to co-residential group composition in archaeology

More often than not, excavation reports and interpretative studies written in the Anglo-American archaeological tradition gloss over the number of people or configuration of the groups which occupied residences in excavated settlements. One does not need to search too hard for a possible explanation for this. Co-residential groups, it is often presumed, could not have been anything other than straightforward examples or unremarkable variations of the

typical nuclear family known to Western archaeologists from their own cultural environments; as such, they merit little attention. Unless ethnographic or ethnohistoric data from the geographical region under investigation evidences living arrangements distinct to those prevalent in the modern West, rarely would a reconstruction of co-residential group composition even be attempted.

This becomes clear when contrasting 'household archaeology' conducted in America with that carried out in Europe. It is common practice for archaeologists working on North American and Mesoamerican material to consult records that describe local indigenous housing and living conditions in the early days of European contact. Through these, they have become familiar with the concept of two or more conjugal couples sharing a residence, and often allow for the possibility of multi-conjugal occupancy in their interpretations of prehistoric social organisation (e.g. Coupland and Banning (Eds.) 1996). Their counterparts working on European material do not have the same benefit: when local ethnographic or historical sources are consulted they seldom reveal living arrangements that challenge the archaeologists' ethnocentric assumptions. As a consequence, it is rare for archaeologists in Europe to reflect on the demographic characteristics of co-residential groups or consider the possibility that an alternative to the nuclear residential pattern might apply to ancient settings (for a notable exception, see Milisauskas 1972).

If multi-conjugal occupancy is raised as a possibility, archaeologists normally look for two spatial attributes to confirm it. Conventional wisdom decrees that there are two telltale signs of multi-conjugal occupancy in a residence:

a) spaces that replicate each other's function (or 'functional replication' for short); and
b) a large ground-plan.

In contexts where the available ethnohistoric evidence and architectural evidence complement one another there is normally no hesitation in interpreting residences as the accommodation of multiple nuclear families. In Mesoamerican cultures, for example, both 'functional replication' and large ground-plans are common: residences typically take the form of large compounds containing several buildings of identical function. On ethnohistoric grounds[1] it is common for each building to be associated with a separate nuclear family (Hirth 1993: 132; Evans 1993: 180; Kintz 1983; Foster et al. 1996). So, too, with the Iroquoian longhouse. Historical documents from the time of early European contact record

[1] It is common for archaeologists working on Mesoamerican material to assume that recent local populations whose lifestyles have been recorded by historians and ethnographers were directly descended from more ancient communities, and that their lifestyles must therefore have been similar. It is beyond the scope of this research to probe into the validity of this 'direct historical approach'.

that longhouses accommodated groups of multi-conjugal structure, and this is readily backed up by their architectural form: longhouses reached lengths of up to 124m and contained a series of hearths along their central axis. On this basis, it has become widely accepted that longhouses as far back as the 15th century were associated with multi-conjugal occupancy (Warrick 1996).

Where ethnohistoric evidence is not readily backed up by the anticipated architectural forms, on the other hand, archaeologists tend to dispute the existence of multi-conjugal occupancy. The prehistoric pueblos of the American Southwest are a prime example of this. Pueblos are notoriously hard to reconstruct because the boundaries of individual residences are difficult to distinguish within aggregate room blocks, and the number and function of rooms on upper storeys is often unknown. Consequently, it is rare to identify rooms within a single pueblo that have the same function (for an exception, see Lowell 1991: 60). Despite abundant ethnohistoric evidence from this region showing that couples in the recent past co-resided with their married daughters and sisters, in the absence of clear-cut 'functional replication' archaeologists tend to infer that pueblos "were the homes of nuclear families" (Cameron 1996: 71).

On the face of it, the reliance on material evidence (rather than ethnohistoric records) reflects good archaeological practice. However, this is only true if we can be confident that the archaeological evidence is being interpreted correctly. The investigation in Part II of this thesis challenges what are conventionally viewed as sound architectural indicators of multi-conjugal occupancy.

The first of the supposed indicators of multi-conjugal occupancy is the existence of 'functional replication'. The investigation in Chapter 6 revealed that, on the contrary, the occurrence within a residence of several rooms with the same function does not automatically signify the co-residence of conjugal couples. Although at least two 'conjugal rooms' are required for such a living arrangement,[2] groups of no-conjugal or one-conjugal structure quite often also use multiple 'actual sleeping spaces' if they prefer some of their members to sleep apart.

The second of the supposed indicators is a large ground plan. The investigation in Chapter 6, however, showed there was no necessary connection between multi-conjugal occupancy and extensive ground-plans. The minimum 20m^2 or so of 'dwelling area' needed by a two-

[2] This assumes we accept the three assumptions listed in section 6.7, and can therefore generalise from the ethnographic findings in Chapter 6.

conjugal group for its two prerequisite 'conjugal rooms'[3] can fit into ground-plans of unremarkable proportions, especially if a residence has more than one storey. Meanwhile, residences of substantial 'ground-plan area' may be occupied by groups of simple structure who had the opportunity or funds to acquire a large plot, or to amalgamate their residence's ground-plan with that of an adjacent residence.

Archaeologists are therefore mistaken in some of their expectations about the architectural forms associated with multi-conjugal occupancy. This, together with a lack of familiarity amongst European archaeologists with multi-conjugal living arrangements, suggests a worrying possibility: that the occurrence of multi-conjugal occupancy in ancient contexts has largely gone unrecognised.

7.3 Ancient residences and co-residential groups: a selective literature review

While the issue of co-residential group composition is often avoided in archaeology, there are a small number of studies which have tackled it, with varying degrees of success. Four of these are reviewed below. All share the fact that their writers were aware of multi-conjugal occupancy as a possibility, but made their deductions without calling upon ethnographic or ethnohistoric parallels. Instead, they based their interpretations on the spatial attributes of the residences in their regions and periods of interest.

[3] Again, this assumes we accept the three assumptions listed in section 6.7, and can therefore generalise from the ethnographic findings in Chapter 6.

Case 1

In an article published thirty years ago, Smith examined Roman villas situated in provinces north of the Alps and identified in a large proportion of them the operation of a so-called architectural "unit system" (Smith 1978: 162): plans that incorporated duplicate or triplicate structural elements arranged as wings or free-standing buildings. Such villas he interpreted as being "occupied not by a single family and its dependants but in something more like joint occupancy or co-proprietorship". Smith's analysis picked out deviations from the classical canons of design, which he saw as adaptations made "to express the needs of a social order based on joint occupancy" (ibid. 170).

Criticism has been levelled at Smith for associating each of the repeated elements with a different family, as opposed to, say, male and female residents, or family and servants (Morley 1999). This criticism could equally be applied to most archaeological contexts where 'functional replication' has been claimed. The only reason that 'functional replication' in ancient Mesoamerican compounds does not appear to suffer from this interpretative ambiguity is because ethnohistoric data (and the assumption of historical continuity) has been used to identify individual rooms not as the accommodation of different genders or of servants but of entire nuclear families.

The most obvious weakness in Smith's interpretation, however, was the impossibility of determining whether the repeated structural elements in each villa had corresponding functions. Room functions could not be identified owing to complicated archaeological formation processes. There was consequently no unequivocal evidence of *functional* replication in the villas to support the notion of multi-conjugal occupancy.

Case 2

Also of relevance is a widely-cited study by Stone which dealt with housing in Old Babylonian Nippur (Stone 1981). The author proposed that co-residential groups "where two or more families share a single structure" (ibid. 26, footnote 13) "tended to occupy large, square houses with rooms on all four sides of a courtyard, while nuclear families occupied smaller, linear houses with rooms on two or three sides of a courtyard" (ibid. 32).

...continues overleaf

Case 2 (continued)

Multi-conjugal occupancy was identified on the basis of 'functional replication' in the square-shaped residences. This identification, however, was founded on a questionable methodology. Rooms were defined as multifunctional 'living rooms' from their dimensions and location rather than their contents. The dimensions chosen to define a 'living room' (7.25m^2 or more) appeared to be set specifically with the aim of achieving a count of just one 'living room' per linear house, and more than one per square house. Rooms in linear houses which had a suitable location and slightly smaller dimensions were conveniently ignored (e.g. locus 191 in residence *F*, with an area of 6.72m^2).

A more compelling argument for the occurrence of multi-conjugal occupancy was made in the same article by matching up a series of ownership transactions with the sequence of architectural modifications carried out on residence *I*. The documents were recovered from the large square-shaped residence *I*, and attest to its inheritance by a group of four brothers and its gradual redistribution between two parties, the youngest brother and his neighbours (another pair of brothers). Architectural analysis revealed a corresponding history of adjustments to the rooms of the residence, culminating in the creation of a linear residence and the amalgamation of the remaining rooms with an adjacent property. Stone's contention was that a multi-conjugal group existed when the original two brothers possessed residence *I*, and again at the final stage of the process when the neighbours bought some rooms and added them on to their own residence (ibid. 26). According to this theory, the neighbours bought the rooms to accommodate their expanding co-residential group, which would have grown as male members married and introduced their spouses and dependants to their residence.

Stone's interpretation is certainly plausible, though it is worth bearing in mind that co-ownership need not equate with co-residence. Nippur had a real-estate market (ibid. 25), so the acquisition of rooms by the occupants of the adjacent residence may have been spurred on by financial motives rather than demographic considerations (see Table 6.4). Moreover, it would have been in the owners' interests to record their names in any property transaction even if they were not all occupying the residence at that time. Whilst it is possible that each set of co-owners in Stone's study co-resided, it is equally possible that they resided apart while continuing to stake their claim on various rooms of residence *I*. The ownership documents, therefore, should not be deemed conclusive evidence of the owners' residential arrangements.

Case 3

Another relevant study is my own work on Bronze Age residences in the settlement of Mallia in Crete (Romanou 2007). A small number of remarkably well preserved residences were analysed in terms of their artefact assemblages and the architectural attributes and spatial relationships of their rooms. Definite signs of 'functional replication' in one residence ($\Delta\beta$) were taken to suggest occupation by a two-conjugal co-residential group.

The strength of this interpretation lay in the precision with which replication was identified. Four residences were used to illustrate the existence of a standard residence 'type' in Mallia, with a very specific spatial configuration, distribution of activity areas, and 'dwelling area' (c.36m^2); once this had been established residence $\Delta\beta$ was introduced, with its much greater 'dwelling area' and the same configurational pattern in duplicate. Although no 'cooking spaces' or 'actual sleeping spaces' as such were identified, it was clear that the entire set of spaces found in other residences (and all the functions therein) occurred twice in $\Delta\beta$.

The interpretation also suffered from some shortcomings. The small size of the sample meant that just one residence could be securely classified in this way, and it was not possible to provide substantial support for the wider occurrence of multi-conjugal occupancy in the community. The relevance of this social model for Mallia was nonetheless bolstered through the exploration of diachronic structural changes and modifications in the use of space within residences. Evidence of partial abandonment and indications of overcrowding at various points in time in individual residences suggested that co-residential groups could experience considerable contraction and expansion in their population size, as one would expect in contexts where stem or joint residential patterns are practised.

It is rare to find studies like the three outlined above, which, unprompted by recent ethnohistoric sources, argue in favour of multi-conjugal occupancy. It is rarer still to find an archaeologist who would go to the trouble of justifying why certain residences were occupied by nuclear families rather than groups of more complex structure. Whitelaw's study of Minoan urbanism includes a section which does exactly this in connection with the Late Bronze Age settlement of Gournia in Crete (Whitelaw 2001: 17-19).

Case 4

In a paper published in 2001, Whitelaw identified the operation of a nuclear residential pattern in the Minoan settlement of Gournia based on the "relatively small size ['ground-plan area'], and particularly the standardization in size" of its residences (Whitelaw 2001: 18). The standardisation in size was brought into focus by contrasting it with the variability of 'ground-plan areas' in Aliabad, a present-day community whose inhabitants practise a joint residential pattern (and, incidentally, one of the communities included in the ethnographic sample in this thesis). Whitelaw proposed that the reason Gournia did not have Aliabad's variability was that all of its residences accommodated groups of simple structure, whereas Aliabad also contained groups consisting of two or three conjugal couples.

Several of the arguments made in Chapter 6 cast doubt on this interpretation. It was argued there that non-demographic factors can be responsible for shaping the 'ground-plan areas' of residences. In communities like Aliabad that have a real estate market, differences in 'ground-plan area' can often be attributed to financial or contextual factors, such as the differential ability of occupants to invest in large building plots and the residences' divergent histories of subdivision (Table 6.4). These factors are more likely to explain the variability in 'ground-plan areas' in Aliabad than the demographic characteristics of co-residential groups which Whitelaw referred to.

At the same time, non-demographic factors could explain why the range of 'ground-plan areas' in Gournia was quite modest (see 'Design-related' factors in Table 6.4). Residences in Gournia were structurally capable of supporting multiple storeys, so any additional 'dwelling area' required by inhabitants could have been added vertically without extending the boundaries of residences. It may also be recalled that residences which contain negligible amounts of 'non-dwelling area' inevitably have modest 'ground-plan areas'. This was true of every residence in Gournia, since residences there had almost no unroofed spaces (never courtyards, only small light-wells), and storerooms were always tucked away on a separate storey underneath a residence's living spaces, rather than spread out next to them on the same storey (cf. McEnroe 1982). All of these design features meant that residences could have contained variable amounts of 'dwelling area' – suited to the needs of either small or large sized co-residential groups, of either simple or complex structure – while their footprints retained modest dimensions.

...continues overleaf

Case 4 (continued)

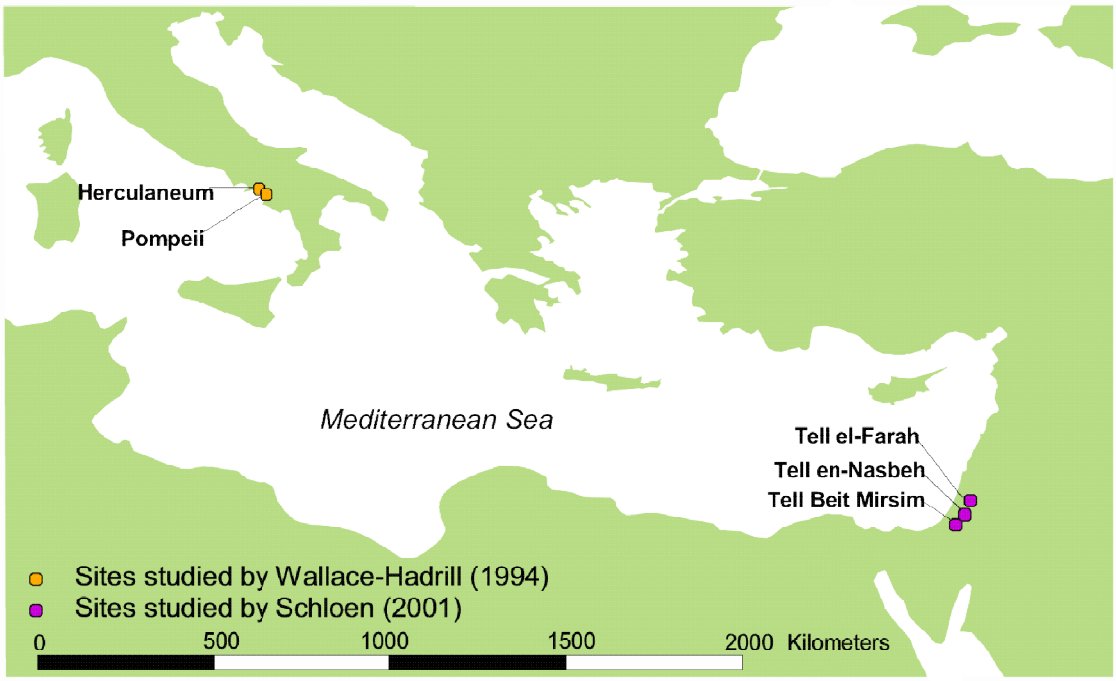
A further possible explanation for the modest range of 'ground-plan areas' in Gournia is that building plots were given standardised street frontages and similar dimensions because it was a settlement designed and laid out by surveyors (Romano 2003). If the inhabitants of Gournia had an aversion towards conspicuous consumption (cf. Whitelaw 2001: 21) then perhaps no co-residential group would have wanted to stand out from its neighbours by extending its residential boundaries through the acquisition and amalgamation of adjacent ground-plans.

Thus, a number of factors, all unrelated to co-residential group demographics, may have conspired to create 'ground-plan areas' of uniformly modest scale in Gournia. Further study of Gournia could potentially demonstrate that all residences were indeed built to accommodate one-conjugal groups: if, for example, they turned out to have standardised food storage capacities or uniform 'actual sleeping space' counts. However, the similarity of their 'ground-plan areas' should not, by itself, be taken as an indication of a nuclear residential pattern.

These illustrations help us to pinpoint a number of issues that can hamper the deduction of co-residential group composition on the basis of archaeological data. The studies by Smith (1978) and Stone (1981) highlight one difficulty: identifying 'functional replication' within excavated residences when the evidence for the use of rooms is sparse or ambiguous, as is often the case when residences have not experienced sudden devastation. A second difficulty was encountered in my study of Mallia (2007): small samples of excavated residences mean there is little opportunity to confirm a suspected residential pattern. A third difficulty was demonstrated by Whitelaw's attempt to recognise a residential pattern on the basis of 'ground-plan area' (2001): the persistence of mistaken assumptions about the relationship that exists between co-residential group demographics and the spatial attributes of residences.

These problems resurface in two more archaeological case-studies which are reviewed at some length below. The first is Wallace-Hadrill's investigation of two extensively excavated and well-known Roman settlements in the Bay of Naples (Wallace-Hadrill 1994); the other, Schloen's study of three Iron Age settlements in the southern Levant (Schloen 2001). The locations of all the sites are shown in Figure 7.1.

FIGURE 7.1 Map of the central and eastern Mediterranean showing the locations of the archaeological sites studied by Wallace-Hadrill and Schloen



Wallace-Hadrill and Schloen should be applauded for seeking answers to a commonly neglected question: what sorts of groups occupied the residences uncovered through excavation? The authors should also be applauded for the resourceful ways in which they drew on a combination of historical, archaeological, and analogical data to make their cases. However, as we shall see, their interpretations were premised on a number of misapprehensions regarding the ways in which co-residential group demographics find expression in the spatial attributes of residences. The ethnographic investigation in Chapter 6 helps us bring these to light, and prompts us to search for new interpretations based on room counts and areal measurements. In trying to do this, it immediately becomes apparent that the archaeological record presents complications which restrict the inferences we can make.

The objective in talking through these two case-studies in detail is to consolidate our appreciation of the difficulties that archaeologists face in deducing the composition of ancient co-residential groups. An important point to note is that the difficulties can differ in their nature and severity: this is apparent when comparing Pompeii and Herculaneum to the Levantine sites. The two contexts also differ in terms of the help that historical evidence can offer in reconstructing co-residential group composition.

7.4 Wallace-Hadrill's study of Roman Pompeii and Herculaneum

In 1994, Wallace-Hadrill brought together several papers that had already appeared in print into a single comprehensive publication of his work on the residences and inhabitants of Pompeii and Herculaneum (Wallace-Hadrill 1994). The extensively unearthed remains of the two Italian settlements, made famous by their level of preservation following the effects of a volcanic eruption on the 24th of August AD 79, are thought to provide some of the best archaeological evidence of Roman urban residences.

Pompeii and Herculaneum provide an excellent opportunity to explore how far demographic issues surrounding co-residential groups can be pursued in archaeology. This is because the archaeological records from these sites, although lacking the integrity that is often supposed by those who are not closely familiar with the settlements' remains, are nevertheless superior in quality and volume to the records of most other contexts (not least that of Bronze Age Cyprus, explored in Chapter 8). Furthermore, Roman society is relatively well known through its texts as well as its material culture, allowing a two-pronged approach to the reconstruction of co-residential group membership.

One of Wallace-Hadrill's propositions, based largely on textual evidence from the period, was that the grand 'atrium houses' which dominated the plans of both settlements did not accommodate co-residential groups of the straightforward nuclear family type, but were instead occupied by 'promiscuous crowds': owners or tenants together with their kin and non-kin dependants, slaves, freedmen, workers, friends and lodgers (Wallace-Hadrill 1994: 116). Qualitative and quantitative investigations of domestic architecture from the two sites were used to back up this claim.

Wallace-Hadrill's study made use of 234 self-contained ground-plans from across the two settlements (Wallace-Hadrill 1994: Chapter 4). It was not always possible to distinguish if they belonged to buildings which had a residential function, and, if so, whether they had been occupied or vacant at the time of the volcanic eruption. Because of this, Wallace-Hadrill incorporated entire blocks of interlocking buildings (*insulae*) into his data set (ibid. 72f.). It should be noted, however, that his count excluded upper storey apartments reached directly from the street via ground-storey stairwells (ibid. 187-216). The majority of the ground-plans in his sample come from Pompeii (n=182), but the contemporaneous destruction of the two sites and the similarities between them were such that the entire sample was treated as if it belonged to a single community.

The study below begins with a critique of Wallace-Hadrill's interpretation of the architectural evidence (section 7.4.1). This is followed by a fresh look at the historical evidence (section

7.4.2) and archaeological evidence (section 7.4.3) for living arrangements in Pompeii and Herculaneum.[4] Particular attention is drawn to the difficulties that confront us when relying on a sample of excavated residences – even one as well-preserved as this – to reconstruct co-residential group composition. Select examples of residences can nonetheless be used to argue that multi-conjugal occupancy was a distinct possibility in this setting.

7.4.1 Critique of Wallace-Hadrill's approach to the architectural evidence

The 'ground-plan areas' of the residences in Wallace-Hadrill's sample spanned a remarkably broad range ($10m^2$ - $3000m^2$). This provided the material support for his proposal that the inhabitants of Pompeii and Herculaneum were distributed unevenly across the residences, and that the relatively few grand 'atrium houses' must have contained disproportionately large congregations of people from a variety of social backgrounds (the so-called 'promiscuous crowds'). The variation, Wallace-Hadrill claimed, "implies an *expectation* that households will vary enormously in size" (Wallace-Hadrill 1994: 102; original italics). This statement presupposes that the demographic characteristics of their intended occupants played a significant role in determining the ground-plan dimensions of residences.

Below, three arguments are presented in criticism of Wallace-Hadrill's approach. The first refutes the validity of his use of a foil to explain the variation in 'ground-plan areas'; the second introduces the possibility that non-demographic factors can explain the variation; and the third disputes that 'ground-plan area' is indicative of 'dwelling area' in Pompeii and Herculaneum.

The invalidity of using Olynthos as a foil

To demonstrate that the occupants' composition lay behind the variation in 'ground-plan areas', the author presented the Classical Greek settlement of Olynthos as a foil (ibid. 102). Olynthos had a conservative range of 'ground-plan areas', which Wallace-Hadrill put down to the existence of co-residential groups of regular and predictable size (ibid. 75). Placed side by side with Olynthos, the enormous range in 'ground-plan areas' in Pompeii and Herculaneum could be explained as the result of irregular and unpredictable co-residential group size.

However, juridical factors can readily account for the standardisation of 'ground-plan areas' in Olynthos without resorting to demographic explanations. It is almost certain that

[4] A thorough re-examination of the architectural data used by Wallace-Hadrill could not be carried out, as this data was only partially presented in his 1994 publication. A full investigation of all relevant data on the residences of Pompeii and Herculaneum lies beyond the scope of this research.

construction plots in Olynthos were allotted methodically and equitably as part of a major building operation in the late 5th century BC, and that there was a direct prohibition against redistributing or subdividing plots, as there was in other Classical Greek settlements (Cahill 2002: 216ff.). Thus, the picture of relative uniformity probably resulted from the legal obligation to distribute land equally to all citizens, and the owners' obligation to indefinitely maintain their original property boundaries. The imposed uniformity may even have masked significant differences in the membership of co-residential groups. All this disqualifies Olynthos from serving as a foil for drawing out the effects of group composition on 'ground-plan area'.

Non-demographic explanations for the variation in 'ground-plan areas'

If Olynthos is taken out of Wallace-Hadrill's argument then the reasons behind the marked variation in 'ground-plan areas' in the Italian settlements must be opened up to fresh speculation. Table 6.4, which summarises the effects of non-demographic factors on the spatial attributes of residences, can serve as a useful starting point for explaining the variation. Some of the non-demographic factors included in this table comfortably fit the bill if one takes into account the fact that a market economy operated in that context, and that the prevalent socio-economic conditions enabled and encouraged conspicuous consumption, aggrandisement, and social mobility:

1. In Pompeii and Herculaneum, sets of plots were sometimes demarcated and built upon simultaneously to create 'row houses' of comparable scale and plan (Nappo 1997: 99ff.). However, it was much more common for the dimensions of construction plots to differ from the time of their inception (de Kind 1998: Fig.5, Fig.6). De Kind attributed this to the existence of economic inequalities and market forces, which allowed the creation of larger-than-average plots in prestigious locations aimed at attracting wealthy buyers who could afford them (ibid. 194). Moreover, the demarcation of plots probably occurred episodically over a number of decades, including at times of high demand when the increase in prospective buyers would have necessitated a more stringent division of undeveloped land (ibid.). Thus, much of the variation in building plot size can be put down to financial considerations and the existence of a real estate market.

2. A great deal of the observable variation in Pompeii and Herculaneum came about from the subdivision and amalgamation of existing residences. This demonstrates that the redistribution of land was not legally or ethically forbidden in those communities. Several factors suggest that subdivision and amalgamation could have been linked to strategies for financial and social advancement. For a start, real estate in Pompeii and Herculaneum had monetary value, so the subdivision of property and the sale or rent of some of the

portions would have made sense as profit-making enterprises. A rental market in self-contained accommodation existed in Pompeii (Pirson 1997), so it is conceivable that proprietors sacrificed blocks of rooms or upper storeys from their residences in order to take advantage of the opportunity to raise income. The amalgamation of adjacent ground-plans would also have made sense in the competitive, status-conscious society of the Romans, where contemporary texts testify that the quality of a residence was considered to be a sign of the owner's social standing (Wallace-Hadrill 1994: 4). The extension of a residence's boundaries offered citizens with social aspirations and increasing assets the chance to add impressive atria, reception rooms, dining rooms, peristyles and gardens; that is to say, the types of spaces which in fact feature quite prominently in residences with amalgamated ground-plans.

All things considered, the composition of co-residential groups may not have been a primary concern during the formation and modification of residential boundaries. Indeed, if co-residential groups had simply wanted to add or remove 'dwelling area' from their residences in order to achieve a better 'fit' for their members, then they need not have resorted to subdividing ground-plans or amalgamating them with neighbouring ground-plans. Instead, they could simply have shifted the ratio of 'dwelling area' to 'non-dwelling area' within the boundaries of the residence's plot by abandoning existing rooms, converting their functions, modifying the residence's internal plan, or adding rooms on upper storeys. All four of these operations are evidenced in the two settlements, so subdivision and amalgamation would seem redundant for this purpose, suggesting that these may have been undertaken without demographic considerations in mind.

The gap between 'ground-plan area' and 'dwelling area'

Even if 'ground-plan areas' in Pompeii and Herculaneum acquired their dimensions purely through demographic considerations, there is still an obstacle to deriving demographic information from them. The design of the residences in these communities suggests that, in most cases, it is impossible to judge from 'ground-plan area' alone how much 'dwelling area' residences contain.

A quick look at internal layouts in Wallace-Hadrill's sample shows that the living spaces that count towards a residence's 'dwelling area' were not distributed between storeys in a systematic way across every residence. Some residences had enough room for just a shop, storeroom and stairwell below, forcing all their 'dwelling area' to be positioned above; whereas other plots were not so small as to preclude a downstairs location for their 'dwelling area', and so needed to shift only a fraction of it to an upper storey. Since the proportion of 'dwelling area' that ended up at ground level varied from residence to residence, it is a fallacy

to suppose, as Wallace-Hadrill did, that "one is comparing like with like" by studying ground-plans (Wallace-Hadrill 1994: 75).

In fact, it is possible that some of the residences with the smallest 'ground-plan areas' could have been designed to accommodate more populous groups than those with average values. This might have happened in cases where residences with small ground-plans had additional 'formal sleeping spaces' on their mezzanines or upper storeys. It should be noted that most of the residences at the lower end of the scale have upper storeys which stretch over the ground-floors of neighbouring residences (Andrews 2005), belying Wallace-Hadrill's claim that "a plot with a smaller ground area cannot sustain a larger house than a plot with a larger ground area" (Wallace-Hadrill 1994: 75).

Meanwhile, residences with very large 'ground-plan areas' typically incorporated a great deal of 'non-dwelling area' in the form of peristyles or gardens (ibid. 79), as well as spacious reception rooms and formal dining rooms. Such residences may have had less 'dwelling area' – and, accordingly, accommodated fewer people – than some of their smaller counterparts.

In Pompeii and Herculaneum, 'ground-plan areas' cannot serve as a good proxy for 'dwelling areas'. This means that we cannot be confident that 'dwelling areas' would have differed substantially in residences with different 'ground-plan areas', except perhaps when comparing residences situated at the extreme ends of the scale of variation. The variation in 'ground-plan areas', remarkable though it may be, does not in itself substantiate Wallace-Hadrill's claim that inhabitants were distributed in extremely uneven ways across the residences of the two settlements, nor does it give us sufficient grounds to suppose that any of the residences accommodated enormous populations (the 'crowds' envisioned by Wallace-Hadrill).

7.4.2 A fresh look at co-residential group demographics: the historical evidence

Although the ground-plans of residences cannot tell us about the demographic characteristics of co-residential groups, the investigation in Chapter 6 suggests that other spatial attributes might help us determine what types of groups occupied the residences of Pompeii and Herculaneum. Before exploring the spatial attributes of residences, it is worth trying to establish what written sources can reveal about the composition of co-residential groups in this region during the Roman period.

Wallace-Hadrill's thesis was inspired by contemporary literary and legal references which indicated that the relationships of residents to the co-residential group head in Roman society

were not always based on kinship, but could instead be defined through slavery, manumission, employment, clientage, or tenancy (Wallace-Hadrill 1994: 106). On this basis he put forward the idea of the 'houseful', a co-residential group made up of the relatives of the paterfamilias together with an assortment of non-kin dependants (ibid. 113).

Wallace-Hadrill initially seemed open to the possibility that the 'houseful' had a multi-conjugal structure, consisting of several related couples (Wallace-Hadrill 1994: 110). Although he could find no archaeological evidence to either refute or uphold this idea, he ultimately dismissed it, opting instead for the mainstream position which advocated that residences in the Western Roman Empire accommodated just one nuclear family and a variety of dependents (ibid. 117).

To place this in context: Wallace-Hadrill's interpretation conforms to the recent consensus by historians who work on the subject of elite Roman urban 'families'. Previously, on the basis of Latin kinship terms and laws concerning inheritance, scholars believed that Roman co-residential arrangements involved multiple generations of kinfolk together with their retainers. This notion was occasionally challenged over the years (Crook 1967), but was only recently displaced (Parkin 1994; Dixon 1992: 3-11). Now most scholars believe that groups had a single 'nuclear' core – a man, his wife, and their children – which was occasionally disrupted by death and divorce or complicated by remarriage or adoption; in the case of the elite, this core was supplemented by slaves and unmarried non-relatives such as wet-nurses and male child-minders (Bradley 1991).

Two arguments, however, urge us to reopen the question of how co-residential groups were structured in Roman times. The first concerns the nature of ancient historical scholarship on the Roman 'family', which has sidelined investigations of living arrangements and unduly undermined the credibility of multi-conjugal occupancy. The second is that the little textual evidence there is about living arrangements in Roman settings fits with the operation of a joint residential pattern no less well than it fits with the operation of a nuclear one.

The focus of scholarship on the 'family' at the expense of the co-residential group

Various trends in 'family history' scholarship have contributed to bringing the 'nuclear family' to prominence in the past couple of decades. As discussed in Chapter 3 (section 3.1), the focus of family historians since the 1990s has been on literary and epigraphical sources that clarify the emotional links and obligations that existed between kinfolk; their aim has been to understand the individual life course and how roles and life-stages such as childhood, motherhood, and marriage were experienced (Dixon 1992: Chapter 1). This research framework has, quite naturally, highlighted relationships between husbands and wives and

between parents and their children. Although the relationship between each of these categories of person is distinct, all these relationships tend to be conflated into a single concept: the 'study of the nuclear family'.

The 'study of the nuclear family' has consequently become a conceptual shorthand for most modern-style investigations by family historians. Any understandings reached in relation to co-residence, meanwhile, have been incidental to the 'study of the nuclear family', and always fragmentary.

Under the circumstances it is hardly surprising to find that the 'nuclear family' also features heavily in the scholarly conception of the Roman co-residential group. Understandings about co-residence in Roman times tend to arise indirectly out of the historical 'study of the nuclear family' rather than out of any documentary evidence of co-residential groups. More specifically, the historical arguments used to discredit the existence of multi-conjugal occupancy in Roman times have been based on an indirect approach which by its nature over-emphasises the 'nuclear family'. This arguably renders such arguments unconvincing.

Saller and Shaw's article on Roman 'family' relations is a case in point (Saller and Shaw 1984). Their work is widely regarded as providing conclusive evidence that significant bonds existed only between members of the 'nuclear triad' and not amongst extended kin, and has been influential in undermining the notion that other relatives were liable to co-reside (Parkin 1994: 178; Martin 1996: 40). Saller and Shaw studied thousands of tombstones from across the Western Empire, counting instances of funerary commemoration by different categories of dedicator (parent, child, sibling, spouse, grandparent, grandchild, slave, friend, etc.). They found that commemorations by one's immediate family members greatly outnumbered every other type and inferred from this that extended kin groupings did not exist in significant numbers in Roman times.

Flaws can be found in their reasoning, however. A person can simultaneously share 'nuclear' bonds with their family of orientation (i.e. parents and siblings) and with their family of procreation (i.e. spouse and children), so that if all of a person's 'nuclear' relationships were to be viewed concurrently, he or she would quite possibly turn out to be part of a multigenerational network, which could even include multiple conjugal couples. Saller and Shaw did not take the whole set of persons on each tombstone into account, but instead enumerated individual relationships between each category of dedicator and the deceased, prompting Martin to argue that their procedure was "methodologically biased to emphasize the nuclear family and de-emphasize the extended family from the outset" (Martin 1996: 47).

Even more importantly for present purposes is the fact that, as the authors themselves acknowledged (Saller and Shaw 1984: 127), commemorations reflect ties of duty, affection and heirship, and *not* co-residential relations. Co-residence or regular physical proximity might theoretically have strengthened those bonds and indirectly increased the likelihood of a commemorative act; but there is no reason to assume that relatives who did not maintain such emotional or legal ties with the deceased could not have shared a residence with him or her. The study is therefore essentially irrelevant for reconstructing co-residential group membership.

Saller and Shaw's argument demonstrates the trend in historical scholarship which takes as a starting point the sentiments and obligations of individuals towards their kin, and extrapolates on how these might have affected living arrangements. New light might be thrown on the subject of co-residence, and more reliable understandings reached about co-residential group structure, if historical investigations broke free of this trend and adopted a more direct approach: for example, one which dealt systematically with the cases of co-residence documented in narratives of everyday life, such as letters and plays (e.g. Bradley 2000).

The possibility of multi-conjugal occupancy from the textual evidence

The best direct evidence available on who co-resided with whom in Roman times comes from 167 near-complete Egyptian census returns. These firmly demonstrate quite the opposite of what is thought to apply to the Western Roman empire: namely, the existence in the Eastern Empire of multi-conjugal co-residential groups, and their routine formation through the retention of married sons in the parental residence (Bagnall and Frier 1994: 62ff.).

A joint residential pattern might arguably have been a cultural tradition that was not practised by communities in the Bay of Naples, as was almost certainly the case with the Egyptian peculiarity of brother-sister marriage. However, the proven existence of a joint residential pattern in cosmopolitan, trade-oriented, urban centres of the Eastern Empire, including the metropolis of Alexandria, cautions us not to dismiss it out of hand as a credible possibility for communities of the Western Empire where comparable textual data does not exist.

If this pattern had operated outside of Egypt, then one might wonder why there are not more Roman literary references to multi-conjugal occupancy relating to the West (Dixon 1992: 7). Perhaps the reason for this is that it was not the most common type of living arrangement. During the Roman period it would have been unusual for parents to survive much beyond their children's marriage (Saller 1987; cf. section 3.4.1), and this may have been particularly true in the West where there was a prohibition on incest, meaning that marriage partners were not so readily available as in Egypt and childbearing was slightly delayed in a woman's life

(Bagnall and Frier 1994: 133). Moreover, if a joint residential pattern had operated in Pompeii and Herculaneum then groups of multi-conjugal structure would have been particularly prone to dissolution after the death of an elderly co-residential group head. By law, sons became economically independent upon their father's death, and none could exercise authority (*patria potestas*) over their brothers and their property (Crook 1967). Since the various couples in a multi-conjugal group would have had few common financial interests at that point, one may conjecture that any severe social friction between them would have been resolved through physical separation (cf. section 5.2.2). The dissolution of co-residential groups may have lowered the frequency of multi-conjugal occupancy.

Thus, co-residential groups in Roman Italy would likely not have maintained a complex composition for as long as those in Roman Egypt. This, however, in no way undermines the practice of a joint residential pattern, so long as sons were regularly being retained in their natal co-residential groups after their marriage.[5]

In addition, there is reason to think that the retention of sons may not have been the only way in which multi-conjugal groups would have formed in Roman Italy. The Egyptian data shows that it was possible for co-residential groups to have a multi-conjugal structure because their members included married couples who were unrelated to the head. In Roman Egypt, space in owner-occupied properties was often given out or leased to the owners' slaves, manumitted slaves, and other retainers. Live-in dependants such as these can be recognised because, unlike tenants living in self-contained accommodation, they were registered in the same declaration as the owner's family (Bagnall and Frier 1994: 13). Co-residing lodgers were sometimes married to each other, and some couples had their children and other economic dependants living with them (ibid. 65f.); even co-residing slaves occasionally formed socially recognised (but not legally recognised) conjugal bonds with other slaves, though cases of this are thought to be under-reported in the census returns (ibid. 157).

Although there are no census records to document lodgers and live-in retainers in Roman Italy, such persons are widely believed to have existed on the basis of other written sources (George 1997: 299). If co-residing lodgers or slaves sometimes shared conjugal bonds, as their Egyptian counterparts did, then it is conceivable that groups of multi-conjugal structure

[5] So too in Hasanabad, one of the communities in the ethnographic sample whose inhabitants practise a joint residential pattern, where fathers often do not survive to see their sons marry and where married brothers commonly disband their natal co-residential groups (see section 5.2). The joint residential pattern is still clearly discernible by the strong tendency amongst newlyweds to settle in the parental residence of the groom, and by men's tendency to avoid co-residing with married sisters or daughters. In Marrakech, too, where it is common for married brothers to separate soon after the death of their father, the practice of a joint residential pattern is securely evidenced (Schwerdtfeger 1982: 230).

may have formed in Pompeii and Herculaneum through the presence of such couples in the residence of the head and his wife.

While none of the above can be taken as proof of multi-conjugal occupancy or the operation of a joint residential pattern in the Roman West, it can at least be argued that the textual evidence does not provide a basis for ruling out these types of living arrangements. One may therefore proceed with a measure of open-mindedness to the following subsection, which investigates anew what the spatial attributes of the residences of Pompeii and Herculaneum can reveal about co-residential group demographics.

7.4.3 A fresh look at co-residential group demographics: the archaeological evidence

Chapter 6 proposed that the demographic characteristics of co-residential groups could be inferred by identifying, counting and measuring the dimensions of the spaces in which certain activities were carried out: most importantly, sleeping and cooking. Below, we consider how easy it is to identify, count and measure such spaces in the residences of Pompeii and Herculaneum. Then, by adopting the three assumptions outlined in section 6.7 which allow us to generalise from the ethnographic sample to other contexts,[6] we explore whether the residences in the two ancient sites support the possibility that multi-conjugal co-residential groups and a joint residential pattern existed there during the Roman period.

Achieving room counts and areal measurements

'Actual sleeping space' counts, 'cooking space' counts and 'dwelling areas' are required in order to deduce demographic information about co-residential groups. Making these measurements in Pompeii and Herculaneum is not as straightforward as one might suppose. Despite the famed preservation of many residences in the two Italian settlements, in most cases upper storeys have not survived, and the ways in which their rooms were used cannot be reconstructed with any confidence. There is also considerable difficulty in distinguishing which rooms on the ground storey had been used for sleeping, primary cooking operations, and the consumption of everyday meals.

Most notable is the problem of sleeping accommodation. Roman archaeologists tend to refer to any small enclosed space on an upper storey or accessible from the residence's front hall or garden as a *cubiculum*, as long as it lacks evidence of storage, drainage or a hearth (Allison

[6] The three assumptions are: that at least some members of every co-residential group normally cluster together for sleeping purposes; that every conjugal couple normally has its own independently located 'conjugal room'; and that separate cooking spaces are only required to cater for co-residential group members who are unrelated to the head or for multiple conjugal couples.

2004: 166, 171). This label is nowadays understood to mean a bedroom, even though ancient texts did not clearly or consistently define how rooms designated by this term were used (Nevett 1997: 291). Small size, location, and the absence of certain classes of material form a very weak set of diagnostic criteria for sleeping accommodation. The last criterion is particularly problematic because parts of residences in Pompeii (and presumably also Herculaneum) were gradually abandoned in response to a series of earthquake disturbances from AD 62 onwards (Allison 2004: 182ff.). By the time of the eruption the affected rooms would only have contained abandonment deposits or temporary hoards that may not have been representative of the rooms' former everyday uses. Add to this the effects of room recycling; possible scavenging and squatting between the abandonment and destruction events, followed by post-eruption looting (ibid. 179ff.); as well as the incomplete recording of artefacts and their locations by early generations of archaeologists (ibid. 4ff.), and these high profile ancient settlements start to resemble any other more mundane archaeological site, where the interpretation of room function is riddled with challenges.

Other means exist for the recognition of sleeping accommodation. For example, the ends of beds are commonly thought to have slotted into structural recesses, or rested against interruptions in the decoration of walls. However, Allison has argued on the basis of associated artefact assemblages that such features are not always indicative of beds, but may instead mark the installation of cupboards, shelves or other furniture, or of couches used for sitting and dining rather than sleeping (ibid. 43-48). The occasional remains of wooden bed frames, on the other hand, provide unequivocal evidence of sleeping accommodation. Yet only a proportion of 'formal sleeping spaces' can be recognised in this way given the unevenness of preservation across the two settlements, and the fact that we have no reason to presume that inhabitants of every status had access to beds.

Even when bed remains are recovered from a room, there is no way of knowing whether members of the co-residential group slept in the room on a regular basis, so that it would qualify as an 'actual sleeping space'. It could instead have been a spare 'formal sleeping space' which inhabitants swapped for their regular room in another part of the residence in certain seasons, as the Roman elite were known to do (Nevett 1997: 292). Alternatively, it may have been reserved for the accommodation of guests, and put to a variety of daytime uses when guests were not present.

In fact, distinguishing sleeping accommodation that had been in regular use from that which was not constitutes an intractable problem in any archaeological context. Instead of identifying 'actual sleeping spaces' archaeologists can only hope to identify and enumerate all of a residence's 'formal sleeping spaces'. Unfortunately, 'formal sleeping space' counts

cannot yield insights into the actual number of inhabitants in a residence. A 'formal sleeping space' count does not provide a minimum estimate for population size because some of the rooms may not have been in regular use by any of the inhabitants. Nor does it provide a maximum estimate, since rooms could have accommodated more than one person: textual sources tell us that spouses normally slept together (Wallace-Hadrill 1994: 113), while archaeological evidence has revealed the presence of multiple bed frames in some rooms.

While the presence of multiple bed frames confounds the estimation of co-residential group population size, it can be useful in the interpretation of co-residential group structure. In Herculaneum there is one published example of a room in which two intact bed frames were preserved, the smaller of which has been interpreted as a child's bed, and the other (of more typical dimensions) as a double bed for a couple (Maiuri 1958: 419).[7] A possible way to interpret this is that 'formal sleeping spaces' sometimes accommodated entire nuclear families, either by design or through circumstance. If this is true then residences that contain more than one 'formal sleeping space' may have been occupied by co-residential groups of multi-conjugal structure. However, the uneven preservation of bed frames means it is impossible to tell how commonly 'formal sleeping spaces' held multiple beds, and alternative interpretations could equally be applied to 'formal sleeping space' counts.

'Cooking space' counts present a slightly different problem. 'Cooking spaces' in Pompeii and Herculaneum are readily recognisable by their form: each consists of an enclosed room containing a built hearth, and a partitioned-off area on one side containing a 'latrine'. Most excavated residences clearly had only one such room or none, while a few residences contained two 'cooking spaces'. Notably, the clearest instances of duplication occur in residences formed through the amalgamation of adjacent ground-plans. It is therefore possible that the duplication arose inadvertently, and that one of the rooms in each case may have ceased to function as a primary 'cooking space' as soon as the merger was completed.

If we cannot confidently count 'actual sleeping spaces' and 'cooking spaces' in the residences of Pompeii and Herculaneum, then it follows from this that 'dwelling area' is also hard to reconstruct. Altogether, this suggests that the scope for deriving co-residential group demographics from the remains of residences in Pompeii and Herculaneum may be more limited than we would hope.

[7] The residence in question is Herculaneum III, 13. The dimensions of the relatively intact bed-frames are: 120cm x 70cm, and 110cm x 212cm.

The possibility of multi-conjugal occupancy from the design of residences

Given these limitations, is it possible to infer anything about the living arrangements in these communities from the spatial attributes of their residences? The rest of this section picks out a small selection of residences to illustrate that multi-conjugal occupancy was a distinct possibility within the two communities.

Of course, in and of themselves these illustrations do not constitute a reliable evidence base. What the illustrations indicate is that a careful study of the design of excavated residences, combined with the use of well-researched cross-cultural ethnographic analogy, can give rise to a credible alternative interpretation of living arrangements in Pompeii and Herculaneum. The logical next step would be to systematically explore the remarkably large sample of 234 excavated residences from the two settlements with a view to confirming or refuting this alternative interpretation. The extensive exposure at the two sites presents the rare opportunity to do so, though the resources required to carry this out puts it beyond the scope of the present research.

If the three assumptions outlined in section 6.7 are adopted in the case of Roman Pompeii and Herculaneum, then we would expect multi-conjugal occupancy to find architectural expression in multiple 'cooking spaces', and a joint residential pattern to find expression in a high number of 'actual sleeping spaces'. Despite the difficulties we face in identifying room function, these characteristics can indeed be recognised in some residences.

The Casa dell'Efebo in Regio I of Pompeii (VII, 10-12), an unnamed residence in Regio VIII (II, 29-30), as well as the Casa del Tramezzo di Legno (III, 4-12) in Herculaneum, each incorporate a pair of 'cooking spaces' of similar dimensions and design (Allison 2004: 100). Two of these residences are illustrated in Figure 7.2.[8] Each residence was created by joining together what had previously been separate neighbouring residences, so it is theoretically possible that one 'cooking space' in each pair fell out of use at the time when the amalgamation occurred. In fact, this is unlikely: there is no reported evidence that any of the 'cooking spaces' were assigned an alternative function (e.g. storage), no signs that the hearths were dismantled or the so-called 'latrines' deliberately blocked, and no traces of structural conversion in the rooms. The absence of signs of modification in any of the rooms in question is striking when one considers the large-scale conversion works undertaken in other rooms close-by (e.g. the creation of new prestigious dining rooms and expansive unroofed

[8] The two 'cooking spaces' of the Casa del Tramezzo di Legno are in rooms *14* and *29*. Room *29* is adjacent to one of the commercial parts of the residence, but it is unlikely to have had a commercial function: the discovery of a linen-press in space *28* indicates that the shop's business was not food-related.

spaces). In view of this, the duplication of ‘cooking spaces’ may well have occurred by design, with every pair deliberately retaining its original identical purpose as a space for primary cooking activities in order to cater for the needs of a complexly structured co-residential group.

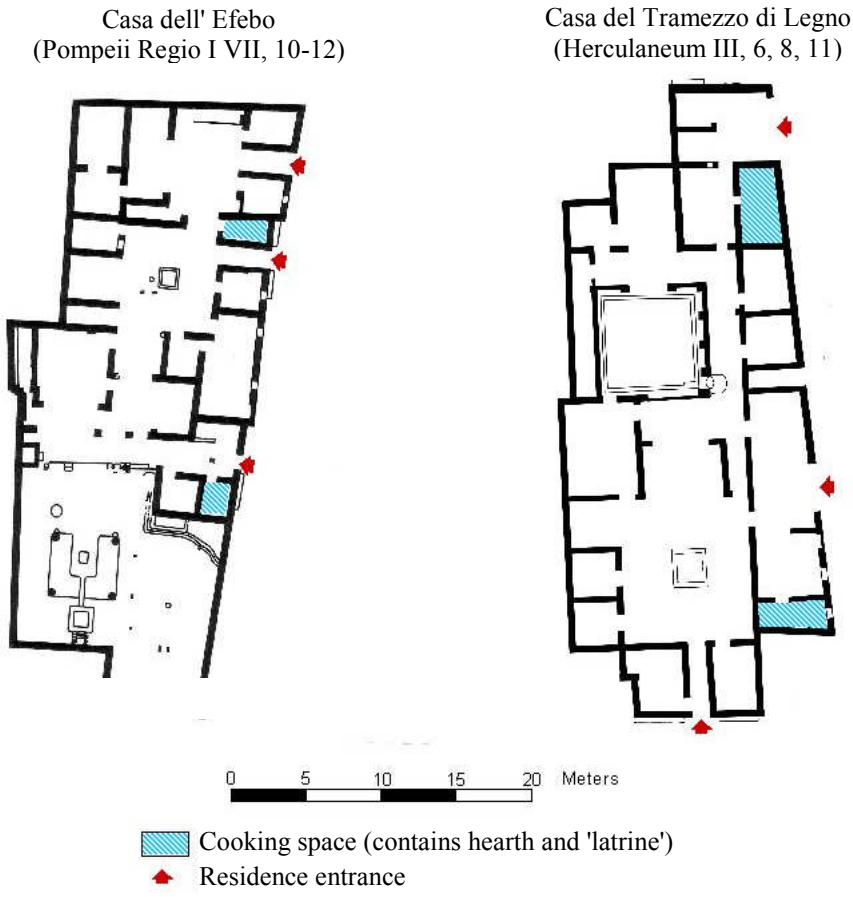


FIGURE 7.2 Examples from Pompeii (left) and Herculaneum (right) of residences containing two 'cooking spaces'

The possibility of multi-conjugal occupancy is also apparent in the fact that high numbers of ‘actual sleeping spaces’ may have existed in some residences. This can be deduced from the extremely high counts of ‘formal sleeping spaces’ they contain: in the Casa del Menandro (Pompeii Regio I X,4), for example, even if as many as half the rooms labelled as *cubicula* were ruled out because their function as sleeping accommodation was misidentified or because they were spares reserved for the use of guests, the remainder (i.e. the probable

'actual sleeping spaces') would still number in the region of five or more.[9] In the case of affluent co-residential groups it could be argued that sleeping accommodation was provided in large numbers to accommodate members who wanted to sleep alone or live-in dependents such as slaves, rather than for co-residing conjugal couples (see Table 6.4). However, high numbers of 'actual sleeping spaces' can be reconstructed even in residences whose occupants were not wealthy.

The Casa del Fabbro in Pompeii (Regio I X,7) and the Taberna in Herculaneum (IV 17-18) are examples of humble residences with probable counts of five or more 'actual sleeping spaces' (Figure 7.3).[10] Such high numbers cannot be explained as somehow related to the occupants' wealth, as no traces of affluence were revealed in connection with the residences: both sit on modest-sized plots and have relatively little decorative elaboration, while the finds from the Casa del Fabbro indicate that its inhabitants practised menial occupations in commerce or industry (Ling 1997: 162). The most likely explanation for such a high demand for sleeping accommodation may be that several conjugal couples existed amongst their occupants. It should be noted that not all humble residences contained a large number of spaces dedicated to sleeping.[11] Therefore these two residences could indicate the existence of multi-conjugal groups side-by-side with groups of simpler structure, as we would expect if a joint residential pattern had been practised in Pompeii and Herculaneum.

[9] In the Casa del Menandro, five rooms are labelled as *cubicula*: *1*, *6*, *7*, *17* and *43* (Ling 1997: 265, 267, 272, 319), but there are undoubtedly more on the upper storey. Rooms *14* and *21* had clearly been converted in the final phase of occupation in order to store goods (ibid. 137), but Ling did not find this function incompatible with sleeping: he pointed out that "room *43* demonstrates that use of a room for storage does not preclude the presence of a bed" (ibid. 139), and mentioned this possibility in connection with rooms *28*, *20* and *20a*. Other potential 'formal sleeping spaces' include two rooms with windows that had temporarily been emptied in order to be redecorated (*32* and *33*); and several heavily disturbed rooms with windows, arranged in a row on the eastern side of the residence (*35*, *36*, *37* and *38*).

[10] In the Casa del Fabbro in Pompeii (Pompeii Regio I X,7), Ling identified three ground-storey rooms as *cubicula*, proposed that a ground-floor dining room had been converted into sleeping accommodation in the last phase of occupation, and claimed there were more *cubicula* on the upper storey (Ling 1997: 150-170). In the Taberna (Herculaneum IV 17-18), de Kind identified up to nine ground-storey rooms as 'living rooms', and more 'living space' on the upper storey (de Kind 1998: 165-166). Even if some of these rooms were not in use as everyday sleeping accommodation, the probable 'actual sleeping spaces' in each would still likely number five or more.

[11] For example, the Casa del Papiro Dipinto (Herculaneum IV, 8-9) and the two extremely well preserved residences making up the Casa a Graticcio (Herculaneum III, 13 and III, 14-15) definitely contain no more than three 'formal sleeping spaces' each.

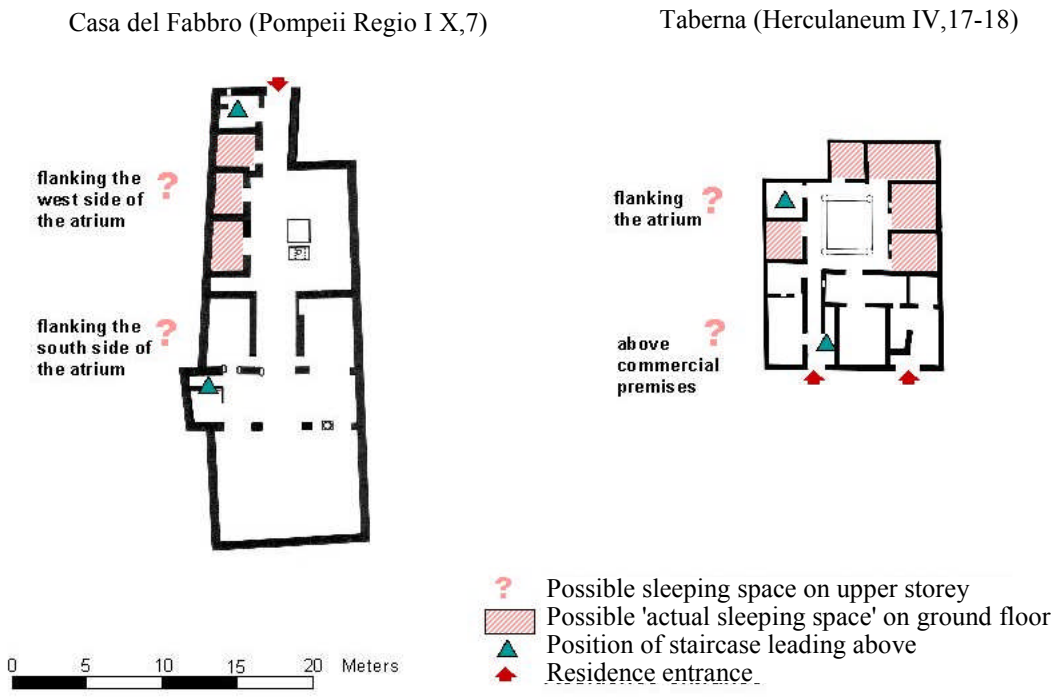


FIGURE 7.3 Examples from Pompeii (left) and Herculaneum (right) of residences which probably contain five or more sleeping spaces

7.4.4 Summary

Pompeii and Herculaneum offered the chance to explore whether the reconstruction of co-residential group demographics from archaeological remains was feasible under exceptionally propitious conditions. The sites' state of preservation and extensive exposure, coupled with the existence of historical texts which could offer clues and supplementary evidence of living arrangements, made this a very promising archaeological context in which to attempt reconstruction.

The investigation began by arguing that, on the basis of what we learnt in Chapter 6, 'ground-plan areas' should not be used in this instance to draw inferences about co-residential group composition. After reviewing the historical evidence of Roman living arrangements, it was proposed that there was no reason to rule out the possibility of multi-conjugal occupancy. However, when the remains of the residences and their contents were scrutinised in order to explore this possibility, considerable difficulties were revealed in identifying, counting and measuring the rooms used by occupants for sleeping and cooking. These problems were apparent even though the two sites are commonly thought to be amongst the best preserved in the archaeological record. Nevertheless, signs of multi-conjugal occupancy and the practice of a joint residential pattern could be inferred from the spatial attributes of a small number of residences. It now remains for this interpretation to be tested using as many as possible of the 234 excavated residences from the two sites.

7.5 Schloen's study of three Iron Age II Israelite settlements

In a book entitled *The House of the Father as Fact and Symbol. Patrimonialism in Ugarit and the Ancient Near East* (Schloen 2001), Schloen dedicated a chapter to elucidating the nature of social organisation in Israel during the monarchic period (Iron Age II). On the basis of biblical texts he proposed that the communities of the time practised a joint residential pattern, with sons remaining in their parental residences after their marriage. He backed up this interpretation with the analysis of residences from three settlements: Tell Beit Mirsim, Tell el-Far^{c}ah and Tell en-Naşbeh.

The archaeological remains of residences in the three Levantine sites differ in one important respect from those in Roman Pompeii and Herculaneum: the quality of their preservation. The poor preservation of the Iron Age residences can partly be explained by their design. Another difference between the two contexts is that there is very limited historical evidence available in connection to living arrangements during the monarchic period. Schloen inferred the practice of a joint residential pattern from biblical texts, possibly post-dating the Iron II period (Schloen 2001: 150), which indicated that it was usual for three or four patrilineally related generations of kinfolk to live together at that time (ibid. 135). He took this to mean that individual residences were occupied by multiple related nuclear families, thus departing from popular scholarly opinion which saw related nuclear families distributed across sets of neighbouring residences (ibid. 167). There are no census returns or other documents from that time that can offer direct support for either interpretation.

The study below begins with a critique of Schloen's interpretation of the architectural evidence from the three settlements (section 7.5.1). A fresh look at the archaeological evidence (section 7.5.2) focuses on the intractable difficulties that the excavated Israelite residences pose to the inference of co-residential group composition.[12]

7.5.1 Critique of Schloen's approach

To support his interpretation of a joint residential pattern, Schloen relied on evidence from 80 pillared buildings of the type illustrated in Figure 7.4, several of which were linked to each other in pairs (either directly or via a common vestibule or forecourt) to form a total of 68 independent residences from the three settlements.[13] His main analysis was based on the measurement of the area within the residences suited to human habitation. As there is good

[12] A full re-examination of the archaeological remains from Tell Beit Mirsim, Tell el-Far^{c}ah and Tell en-Naşbeh lies beyond the scope of this thesis.

[13] Schloen counted 34 pillared buildings in Tell Beit Mirsim, forming a total of 25 residences; 18 pillared buildings in Tell el- Far^{c}ah, forming a total of 15 residences; and 28 pillared buildings in Tell en-Naşbeh. The 15 residences in Tell el-Far^{c}ah belong to two distinct phases, ten from the earlier (Stratum VIIb) and five from the later (Stratum VIId); Schloen treated each set separately in his calculations.

reason to think that all the habitable spaces in this style of residence were situated on the upper storey (see below), he measured the residences' 'ground-plan areas' and used these as approximations of the habitable space or 'capacity' of their upper floors. He found that several residences had sufficient 'capacity' to accommodate multi-conjugal co-residential groups while others did not.[14] More specifically, his findings showed a 1:2 ratio of large 'capacity' to small 'capacity' residences within each settlement, which he argued was telling: this ratio corresponded to a hypothetical 1:2 ratio of complex to simple co-residential group structures which he associated on ethnographic grounds with the practise of a joint resident

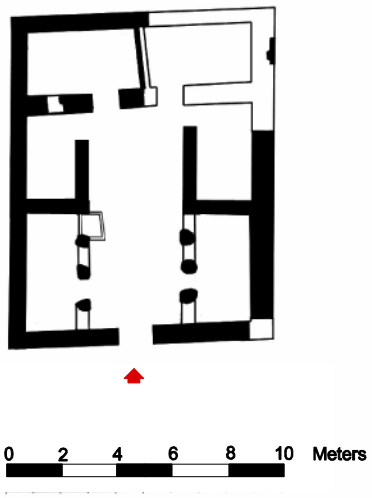


FIGURE 7.4 Plan of a typical Iron II Israelite residence (adapted from Chambon 1984)

In fact there is no reason to suppose that any particular ratio of complex to simple structures should exist in communities characterised by a joint pattern.[15] Leaving this aside, Schloen made several assumptions in his interpretation of the material evidence that cannot be sustained.

Below, three arguments are made in criticism of Schloen's reliance on the 1:2 model of residence 'capacities'. The first and second call into question the identification of a particular ratio of large to small residence 'capacities', firstly because the residences may not have been occupied simultaneously, and secondly because we do not know how representative the samples are of all the residences that had existed in the three settlements. The third argument disputes the idea that the 'capacities' of residences directly reflect the structure of co-

[14] Residences of large 'capacity' were those capable of accommodating a co-residential group of seven or more members, which Schloen took to be the minimum population size of a multi-conjugal group (Schloen 2001: 171, Footnote 50).
[15] Looking at the communities in the ethnographic sample where a complete census was taken and where a joint residential pattern exists, there is no consistency in the proportion of complex groups: 28% in Alibad; 20% in Hasanabad; 12% in Karapinar; and 44% in Xculoc.

residential groups. Altogether this suggests that a 1:2 model of residence 'capacities' does not provide a reliable indication of the practice of a joint residential pattern.

The problem of establishing contemporaneous occupation

Schloen's suggestion of a 1:2 ratio of complex to simple groups refers to one point in time. In order for the ratio of large to small residence 'capacities' to reflect the ratio of complex to simple groups, residences would need to have been occupied contemporaneously. This is not demonstrated by Schloen. In fact, the residences from two of the settlements, Tell Beit Mirsim and Tell en-Naşbeh, belong to long-lasting stratigraphic phases, while abandonment of the settlements appears to have been a gradual affair lasting several centuries (Schloen 2001: 146; Zorn 1997: 102). During those centuries, occupation of some residences may have ceased while continuing in others, and new residences may even have been built next to dilapidated ones. Since we cannot assume occupation to have been simultaneous amongst a set of residences belonging to the same archaeological stratum, we have no evidence that the 1:2 ratio of large-'capacity' to small-'capacity' residences obtained at any one moment in time.

The problem of incomplete settlement exposure

The residences exposed through excavation constitute an unknown sample of a settlement's housing stock, in this case barely approaching half of the total, and possibly unrepresentative of the entire range of housing types. If the hypothetical ratio of complex to simple co-residential group structures in a community (1:2) did manifest itself in the settlement's distribution of residence 'capacities', a biased housing sample would reflect a skewed version of it. Schloen did not pay due consideration to the possibility of bias in his residential samples, and hence the possibility that the 'capacities' in his samples may over- or under-represent the actual proportion of complex co-residential groups in each community.

The non-correspondence between group structure and 'residence capacity'

Theoretically, a residence' 'capacity' (i.e. the area of its upper floor) might include spaces used for circulation, and rooms reserved for the entertainment or accommodation of guests, or for ceremonial or specialised functions.[16] Schloen's 1:2 model of residence 'capacities', however, did not take account of the potential existence of such spaces.

The 1:2 model of residence 'capacities' assumes that complex co-residential groups occupy residences of large 'capacity' while simple co-residential groups must necessarily occupy

[16] A residence's 'capacity' should therefore not be confused with the areal measurement referred to in the present research as 'dwelling area', which consists only of enclosed spaces used on a day-to-day basis by the residents for their everyday living.

residences of small 'capacity'. This overlooks the possibility that the residences held variable numbers of ceremonial rooms, or incorporated spare 'formal sleeping spaces' (reserved for guests, or built to meet the needs of more populous or complex groups that had occupied the residence in the past).[17] If such spaces did exist, then at least some groups of simple structure may have lived in residences of substantial 'capacity'. If this was the case, the distribution of residence 'capacities' in the settlements would not accurately represent the proportion of different types of co-residential group structure in the communities.

7.5.2 A fresh look at co-residential group demographics: the archaeological evidence

While the 1:2 model of residence 'capacities' cannot be used to identify the residential pattern practised by the inhabitants of Tell Beit Mirsim, Tell el-Far^{c}ah and Tell en-Naşbeh, Chapter 6 proposed that demographic information could be derived by identifying, counting and measuring the dimensions of spaces used for sleeping and cooking. But can such spaces be identified in Iron Age II Israelite residences?

Preservation in the three Levantine sites is poor: this is true not only in comparison to Pompeii and Herculaneum but also compared with many other archaeological sites. The poor preservation of the residences mainly comes down to their design. The buildings were designed from the outset with pillars to support upper storeys, meaning there is a strong likelihood that the ground and upper floors were assigned distinct functions. Since material evidence from some ground floors shows that they were dedicated to storage and stabling, one may assume – as Schloen did (Schloen 2001: 176) – that sleeping, cooking and everyday living were carried out upstairs. However, no upper storeys at all have been preserved, and evidence of all these everyday functions, and the dimensions and layouts of the rooms that accommodated them, have been lost through collapse and archaeological formation processes.

The design of the Israelite residences precludes counts of 'actual sleeping spaces', 'formal sleeping spaces', or 'cooking spaces', and this in turn rules out the calculation of 'dwelling area'. Naturally, this severely limits the information that can be derived from the residences about co-residential group demographics. One very basic inference that can be drawn if 'ground-plan area' is used as a proxy to 'dwelling area' is that the largest residences in each

[17] Spare 'formal sleeping spaces' occur in a fifth of the residences in the ethnographic sample, ranging from 0% in Xculoc (where, due to the nature of the building materials used, new huts are constructed and old ones abandoned with relative ease), to 53% in Hasanabad (where architectural modification is relatively infrequent).

settlement probably accommodated more populous groups than the smallest residences.[18] The occasional pairing together of pillared buildings in Tell Beit Mirsim and Tell el-Farᶜah might also be indicative of the existence of some groups in these communities whose composition was more populous or complex that the rest, though this could just be a sign of the occupants' affluence (see Table 6.4). All told, there is little on which to base the reconstruction of the composition of co-residential groups.

7.5.3 Summary

The Iron Age context provided the opportunity to explore whether the reconstruction of co-residential group demographics was feasible when residences were very poorly preserved, and where there was little historical data on living arrangements.

First, Schloen's approach to interpreting the archaeological evidence from Tell Beit Mirsim, Tell el-Farᶜah and Tell en-Naşbeh was deconstructed, reminding us that samples of excavated residences may not be fully representative of a settlement's housing stock, and that the residences making up a sample may not have been in use at the same time in the past. These were amongst the reasons for suggesting that, in this context, demographic inferences should not be made on the basis of the distribution of residence 'capacities' (i.e. 'ground-plan areas'). In this instance the particular design of the residences – which confined all habitable spaces to upper storeys – proved an insurmountable obstacle to the identification, enumeration and measurement of the spaces used for sleeping and cooking. Because of this, only very simplistic and inconclusive inferences could be drawn from the available evidence.

[18] The ethnographic sample suggested that absolute population size could not be estimated on the basis of 'ground-plan areas', and that multiplying 'ground-plan areas' by Naroll's coefficient is very likely to yield overestimates (see section 6.6.2). Notably, Schloen used Naroll's coefficient to argue that the population of some co-residential groups reached double figures, with a maximum of 13 in residences consisting of a single pillared building (Tell en-Naşbeh 'house 434') and a maximum of 17 in residences consisting of pairs of pillared buildings (Tell Beit Mirsim, 'house 23/5' and 'house 33/12'). An alternative coefficient (one eighth) was also used to allow for the possibility that the central area of each residence consisted of an unroofed courtyard (Schloen 2001: 138).

7.6 Conclusion

The third major objective of this research has been to establish whether the insights developed from the ethnographic study in Chapter 6 could be used to deduce co-residential demographics from the archaeological record. In theory, provided we accept the three assumptions listed in section 6.7, there is no reason why we could not generalise from the ethnographic findings in Chapter 6 and use 'actual sleeping space' counts, 'cooking space' counts, 'dwelling areas' and 'ground-plan areas' to derive information about the composition of the co-residential groups in ancient communities. In reality, the archaeological record presents complications that frustrate our efforts.

A key difficulty mentioned in connection with many of the archaeological contexts reviewed in Chapter 7 is the state of preservation of the residence remains, which sometimes confounds the ability to recognise, count and measure the spatial attributes from which demographic inferences may be drawn. In extreme situations most of the vital architectural clues have been completely lost: this was the case in Iron Age II Tell Beit Mirsim, Tell el-Far^{c}ah and Tell en-Naşbeh, where residences were designed so that their upper storeys – now collapsed – held all the spaces of interest to us. More worryingly, recognising which spaces were used for sleeping and cooking in the residences of Roman Pompeii and Herculaneum was also a challenge, even though these are widely regarded as two of the best preserved sites in the archaeological record. This suggests that identifying the functions of rooms in excavated residences does not just come down to how well-preserved their architectural structure is, or what state some of their contents are in. Instead, the ability to recognise room function depends on all the various transformations the residences underwent since they were occupied. The importance of unravelling these so-called 'formation processes', and their impact on our ability to draw demographic inferences from the remains of residences is considered in some detail in Chapter 8.

Another difficulty faced by many archaeologists was mentioned in section 7.3 in connection with Case 3, my study of Bronze Age residences in Mallia (Romanou 2007). There, the fact that there was a very limited number of excavated residences meant there was little opportunity to confirm a suspected residential pattern. On the other hand, a positive message can also be take away from the Mallia case study, as well as the case of Pompeii and Herculaneum: the careful study of even a very small sample of excavated residences may be sufficient for recognising vital clues about co-residential group composition, and making credible interpretations about living arrangements in ancient communities. If a greater sample of residences is available, as it is in the Roman Bay of Naples, we can and should use it to

test interpretations, but where it is not then we can always hope to draw on a greater pool of data in the future if more residences are ever uncovered.

Returning to the question of whether the insights developed in Part II can help us deduce co-residential demographics from the archaeological record, the answer is: yes, sometimes they can, as demonstrated by the re-investigation of Pompeii and Herculaneum. In this instance the investigation benefited from the input of historical evidence, but where historical data is lacking , as in the case of Bronze Age Cyprus (which is examined in detail in Chapter 8), archaeologists are completely reliant on the quality of the archaeological record: the degree of preservation, the robustness of the methods used to unearth the remains, the comprehensiveness of publications, and their own ability to interpret the evidence.

Finally, one may question why archaeologists need go to the trouble of discerning living arrangements from the archaeological record. The literature review in section 7.2 revealed that, in fact, the nature of co-residential group membership is often neglected in archaeology, and multi-conjugal occupancy in ancient contexts may have gone largely unrecognised. Since living arrangements constitute an essential dimension of social organisation, this omission has grave implications for the understanding of ancient societies. It behoves archaeologists to reconstruct the configuration of co-residential groups, not only for the sake of piecing together a key aspect of a community's organisation, but because many of the types of interaction, social learning, and social reproduction archaeologists seek to understand took place in the past (as they do now) through the medium of co-residence. Moreover, a better grasp on co-residential group demographics may assist in the accuracy of aggregate population estimates across settlements or wider landscapes.[19]

Archaeologists should be attempting to reconstruct living arrangements, but if they are to do so based on the remains of residences, they need a good understanding of the relationship that exists between co-residential group demographics and the spatial attributes of residences. Many of the archaeological studies reviewed in Chapter 7 contained examples of misapprehensions regarding this relationship. Chief amongst them was a failure to appreciate that room counts and areal measurements are formed through a combination of demographic and non-demographic factors, meaning that spatial attributes may not directly reflect residential patterns or the size or structure of co-residential groups. The ethnographic study in Chapter 6 has equipped us with the ability to recognise such misapprehensions, and it may be hoped that in the future they will be avoided.

[19] The degree of accuracy that can be gained is not easy to gauge, since the average population size of co-residential groups is only one of many assumptions on which aggregate population estimates may be based. A careful consideration of this issue is beyond the scope of this thesis.

CHAPTER 8
Co-residential groups and residences in the Cypriot Bronze Age

8.1 Introduction

Chapter 8 investigates the demographic characteristics of co-residential groups in Cyprus during the Bronze Age (c.2300 BC to c.1050 BC). We have already seen that the poor preservation of residences can impede the inference of co-residential group composition in archaeological contexts. This, however, is only one of the many factors that complicate the archaeological record of Bronze Age Cyprus.

One of the specific aims of this chapter is to call attention to the processes which residences undergo around the time that they are abandoned and thereafter. These can frustrate the recognition of room function, and restrict the number of residences we can draw inferences from. The broader aim is to demonstrate the various challenges faced by archaeologists who wish to infer living arrangements in a prehistoric setting. Bronze Age Cyprus represents a fairly typical example of a prehistoric archaeological record, and therefore constitutes a suitable context in which to explore how the quality and extent of excavation, preservation and publication can impact on the interpretation of living arrangements.

The study begins with a brief overview of what is known about Cypriot Bronze Age society, to provide the background for the rest of the discussion (section 8.2). Section 8.3 describes the residences available to us, and explains how these were selected. The next three sections discuss the various processes that befell the residences since they were occupied (section 8.4) and their implications for the inference of room function (section 8.5), before finally exploring what can be inferred from the residences about the composition of co-residential groups in the Bronze Age (section 8.6). The chapter ends with a brief summary of what the Cypriot material can teach us about inferring the demographic characteristics of co-residential groups from archaeological evidence (section 8.7).

8.2 Cyprus in the Bronze Age

The Cypriot Bronze Age spanned more than a thousand years, from approximately 2300 to 1050 BC. It was a period bounded by two poorly understood migration episodes, each of which was associated with a marked transformation in Cypriot society. Remarkable changes also took place during that time: not least amongst them, the creation for the first time of urban centres with ‘public’ buildings, and the assimilation of Cyprus into the formal trading and diplomatic networks that had been operating in neighbouring regions throughout the second millennium BC.

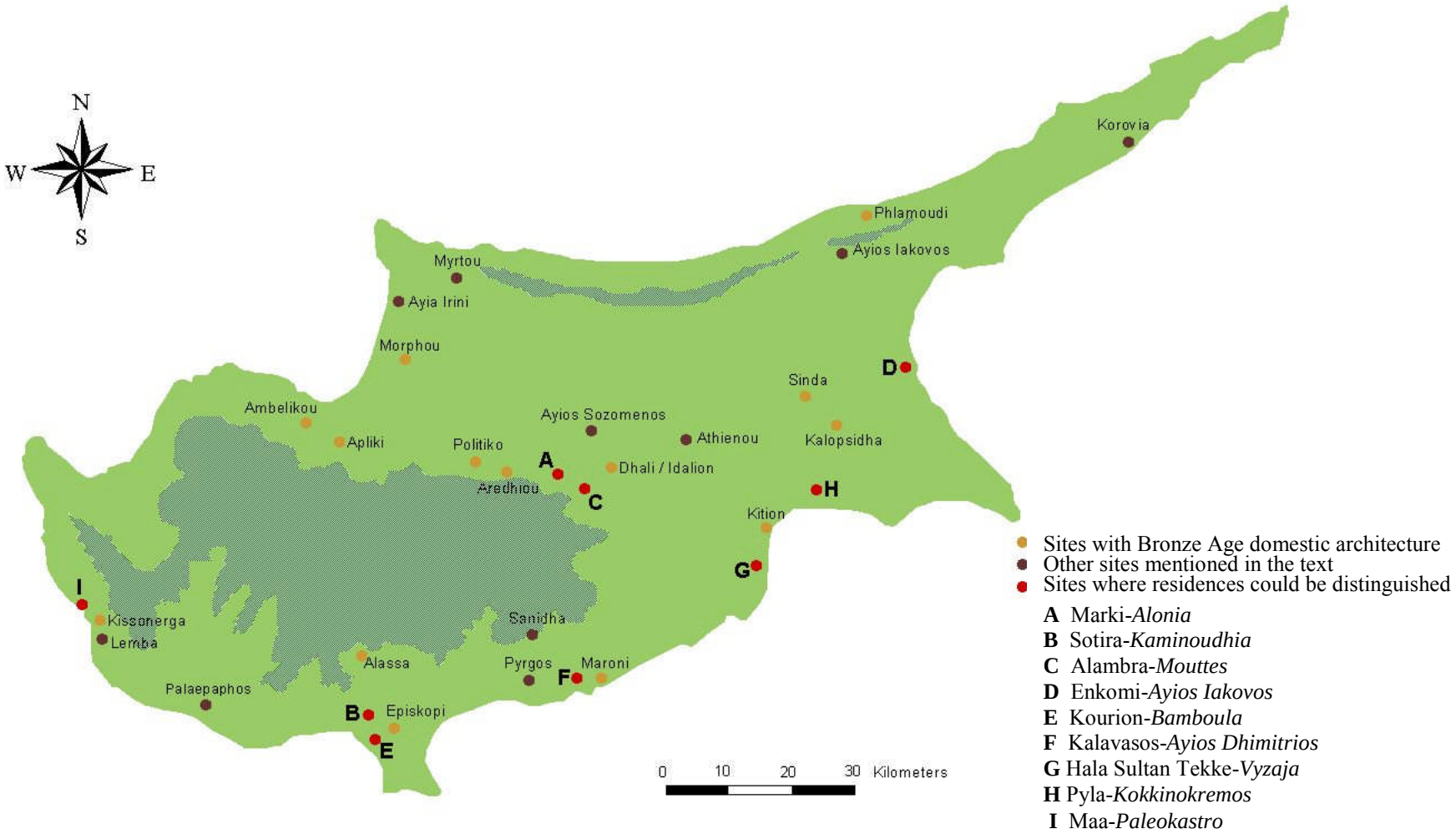


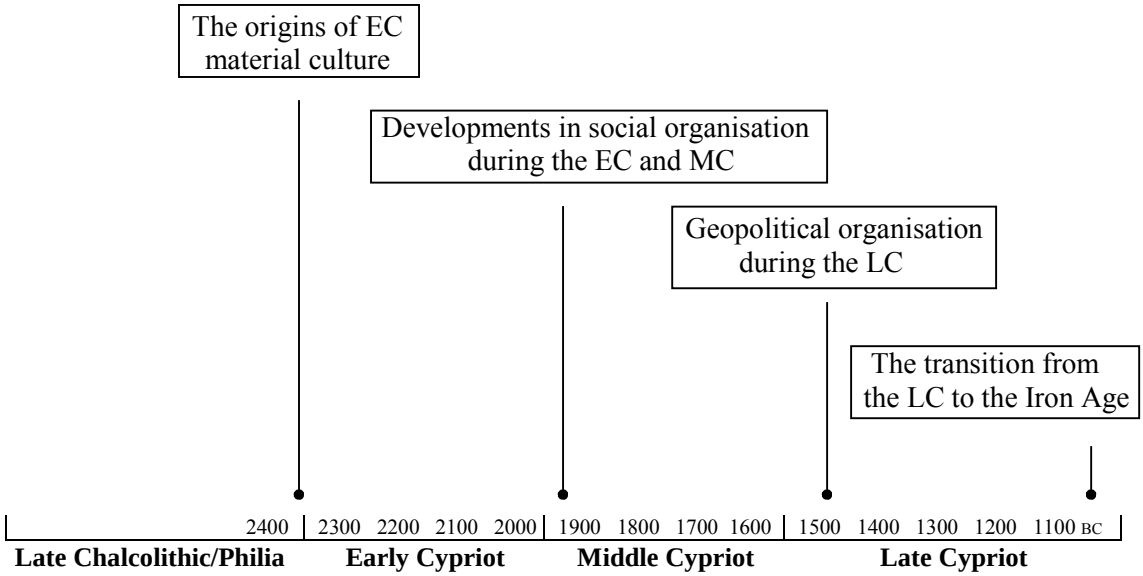
FIGURE 8.1 Map of Cyprus showing the locations of the sires mentioned in the text

The sites singled out in the key are those in which individual residences could be distinguished amongst the Bronze Age architectural remains

Figure 8.1 shows the island of Cyprus and all the archaeological sites mentioned in this chapter. Below, the history of the Cypriot Bronze Age is sketched out. We then briefly consider how the present research on co-residential group composition fits into our current state of knowledge about the period. The final subsection takes stock of what little is known with regard to co-residential groups in the Cypriot Bronze age.

8.2.1 An outline of the period[20]

To outline our current knowledge of Cypriot Bronze Age society, it is convenient to use as landmarks the four main issues that are debated amongst archaeologists dealing with this period of prehistory. In chronological order, these are:



The origins of EC material culture

The first issue concerns the role that foreigners played in the creation of the material repertoire of the EC. Many of the techniques practised during the Bronze Age – in husbandry, cultivation, cooking, the production of textiles and ceramic vessels, building, and metalworking – were unknown during the greatest part of the preceding Chalcolithic period, and only began to appear in the centuries immediately prior to the EC in material assemblages labelled as *Philia* (Webb and Frankel 1999).

Most scholars agree that these practices, along with a variety of artefacts that occur in association with them, had Anatolian antecedents. One school of thought claims that

[20] The abbreviations 'EC', 'MC' and 'LC' are used throughout the text to indicate the Early, Middle and Late Cypriot Bronze Age periods respectively.

instruction in these techniques and their complex scheduling required intensive guidance from those who already possessed the requisite know-how, and regular observation of the tasks involved. This implies the presence of foreign settlers on the island during the Late Chalcolithic, and sufficient interaction with the indigenous population to give rise to a common suite of cultural artefacts by the start of the EC (Peltenburg 1996; Frankel and Webb 1998; Frankel 2005). Until recently, another school rejected the idea that any substantial degree of migration occurred, and instead maintained that the techniques and their trappings were adopted gradually during the Late Chalcolithic and EC by Cypriots with foreign contacts (Knapp 1994: 420f.). Within the last couple of years, however, the gap between these two positions has started to close with Knapp's admission that that

> the co-presence of Cypriotes and foreigners is a necessary precondition for the development of the hybrid practices that offer the most parsimonious and compelling explanation for the appearance of all the innovations seen in [early Bronze Age] material culture (Knapp 2008: 104).

With migration now more widely accepted, it has become possible to begin focusing on the likely mechanisms of cultural interaction and processes of hybridization that took place at the start of the Bronze Age.

Developments in social organisation in the EC and MC

Urban centres did not arise until the LC, well after the controversial migration episodes. A separate debate has centred on whether any significant developments in social organisation took place during the intervening years of the EC and MC, which could eventually have fostered the socio-political conditions related to urbanism.

Almost nothing about the excavated settlements and cemeteries from the EC and MC can be taken to indicate that society during those periods was more socially differentiated than Chalcolithic society (Frankel 1993). Pottery studies, for example, suggest that if specialists existed they probably operated on a part-time basis and their products were intended only for local consumption (Frankel and Webb 2001: 126).

Nevertheless, a theoretical case can be made that mining and processing of copper intensified during that time in response to foreign demand, perhaps to the point of becoming a specialised enterprise requiring complex co-ordination and division of labour. Two facts suggest this: the frequency of copper-based artefacts in contexts dating to the EC and MC; and documentary evidence that copper, necessary to the manufacture of bronze, was exported from Cyprus to Mari on the Euphrates during the 18th century BC (Muhly 1996: 49), many years before Cyprus' role as a major supplier of copper to cities all around the Eastern Mediterranean was regularly attested in texts. In view of this, Knapp has suggested that

emergent Cypriot elites with contacts in Anatolia introduced a range of techniques to the island from the Late Chalcolithic onwards. These enabled the exploitation of copper resources and unproductive land, and generated a productive surplus which was used to enhance the status of the elites in their communities and sponsor the development of a specialised copper industry with the capacity to supply foreign allies or patrons (Knapp 1993).

There is little material evidence as yet from EC and MC sites of the power differentials entailed by this model. It may be the case that it applied only to the northern parts of Cyprus where complex cemeteries have been identified but no settlements have yet been unearthed (Peltenburg 1996: 27).

The geopolitical organisation of Cyprus during the LC

A third area of research has addressed the geopolitical configuration of Cyprus during the LC. At the start of this period, copper production took place in Enkomi-*Ayios Iakovos* on the eastern coast, in one of the largest buildings constructed in the Cypriot Bronze Age. During the 16th–14th centuries BC, Enkomi procured semi-processed copper ores from inland sources, transported them to the centre along a network of forts, and controlled their refinement, distribution and export (Peltenburg 1996). Enkomi's authority over its surroundings suggests that it may have governed a state. There is insufficient information to establish what relationship Enkomi had with other settlements founded around the middle of the second millennium BC: while some have suggested it constituted the only state on the island up until the 13th century BC (Webb 1999: 307), Crewe's research on Enkomi has led her to suggest that it could not have exercised island-wide control during LCI, but may have gained ascendancy during LCIIA-B (Crewe 2007: 3).

In the latter part of the LC the political landscape may have changed to include several politically-independent states (Merillees 1992) or local factions (Keswani 1996; Manning 1998). Numerous large settlements containing 'public' buildings that date to the 13th century BC have been interpreted as the centres of regional peer-polities, whose relationship to sites in their hinterland has been described as hierarchical (Keswani 1993; Knapp 1996). According to this model, a complex system of redistribution operated between producers and consumers of prestige goods and subsistence goods. Although the internal organisation of these centres may have differed (Keswani 1996), it is generally agreed that each contributed

in some capacity to the international exchange networks to which Cyprus, known in diplomatic correspondence as *Alashiya* (Knapp 1996; Goren et al. 2003),[21] now belonged.

The widely accepted existence of regionally based polities at this time has been questioned by Negbi, who claimed that "only Enkomi actually embodied the true face of 13th-century Cyprus overseas" (Negbi 2005: 30). More recently, Knapp's synthesis of the documentary and material record was used to argue in favour of a single, unified polity during the 14th-13th centuries BC, and a king who controlled the entire island (Knapp 2008:341).

The transition from the LC to the Iron Age

Around 1200 BC or soon thereafter, every occupied settlement on Cyprus known through excavation was either permanently abandoned, or destroyed and rebuilt. On the basis of historical texts, raiders of uncertain origin have been held responsible for the destructive events (Muhly 1984). The same raiders, the so-called 'Sea People', have been associated with similar events which occurred at approximately the same time in other lands bordering the Eastern Mediterranean, disrupting the palatial socio-economic systems of *Alashiya*'s formal trading partners.

These events and their aftermath have been the subject of a great deal of discussion in the archaeological literature on Cyprus. Some scholars draw a line between Cypriot society in the 13th and in the 12th centuries BC (e.g. Negbi 2005), emphasising the Aegean character of the innovations that followed the disruptions, which they attribute to the arrival of foreign settlers (Karageorghis 1994). Others, whilst not denying the existence of settlers, prefer to focus on the continuity across the two centuries in the development of various commercial enterprises. Thus, they emphasise the progressive standardisation of mass-produced painted wheel-made pottery (Sherratt 1991: 191-5); an increasing level of competition and deregulation in copper production, which eventually fostered iron-working (Pickles and Peltenburg 1998); and the endurance of maritime trade in a range of commodities, even after the formal exchange networks between *Alashiya* and its palatial neighbours had become obsolete (Bell 2005).

The migration of peoples from the Aegean may have taken various forms, and perhaps began as early as the 13th century BC, at a time when documents attest to the presence of Near Eastern immigrants, functionaries, and political exiles in *Alashiya* (Knapp 1996: 7, 9). There is no consensus as to whether the migration episode continued during the 11th century BC (Coldstream 1994: 143) or was already a *fait accompli* (Iacovou 2005). In any event, by the

[21] The recent discovery that the tablets sent from *Alashiya* to Amarna and Ugarit were made of Cypriot clay (Goren et al. 2003) is here regarded as conclusive proof of the equation of *Alashiya* with Cyprus or a part of Cyprus.

middle of that century all Bronze Age sites except Kition and Paleopaphos had been abandoned, to be replaced by new sites at fresh locations (Iacovou 1994).

8.2.2 How this study fits in with current scholarship on the Cypriot Bronze Age

Scholarly discourse on Cyprus during the Bronze Age has been dominated by issues such as those outlined above, which deal with socio-political and economic issues at the regional, island-wide, or international scale. Studies about Bronze Age pottery, craft and metal technology, and trading systems have also been popular (e.g. Barlow et al. (Eds.) 1991; Muhly et al. (Eds.) 1982; Gale (Ed.) 1991). By contrast, little attention has been paid to the nature of the social groups that existed within individual settlements. Questions about co-residential group composition and residential decisions deal with this finer level of social organisation. The present research therefore adds to and complements the broader picture that has already been built regarding Bronze Age social organisation.

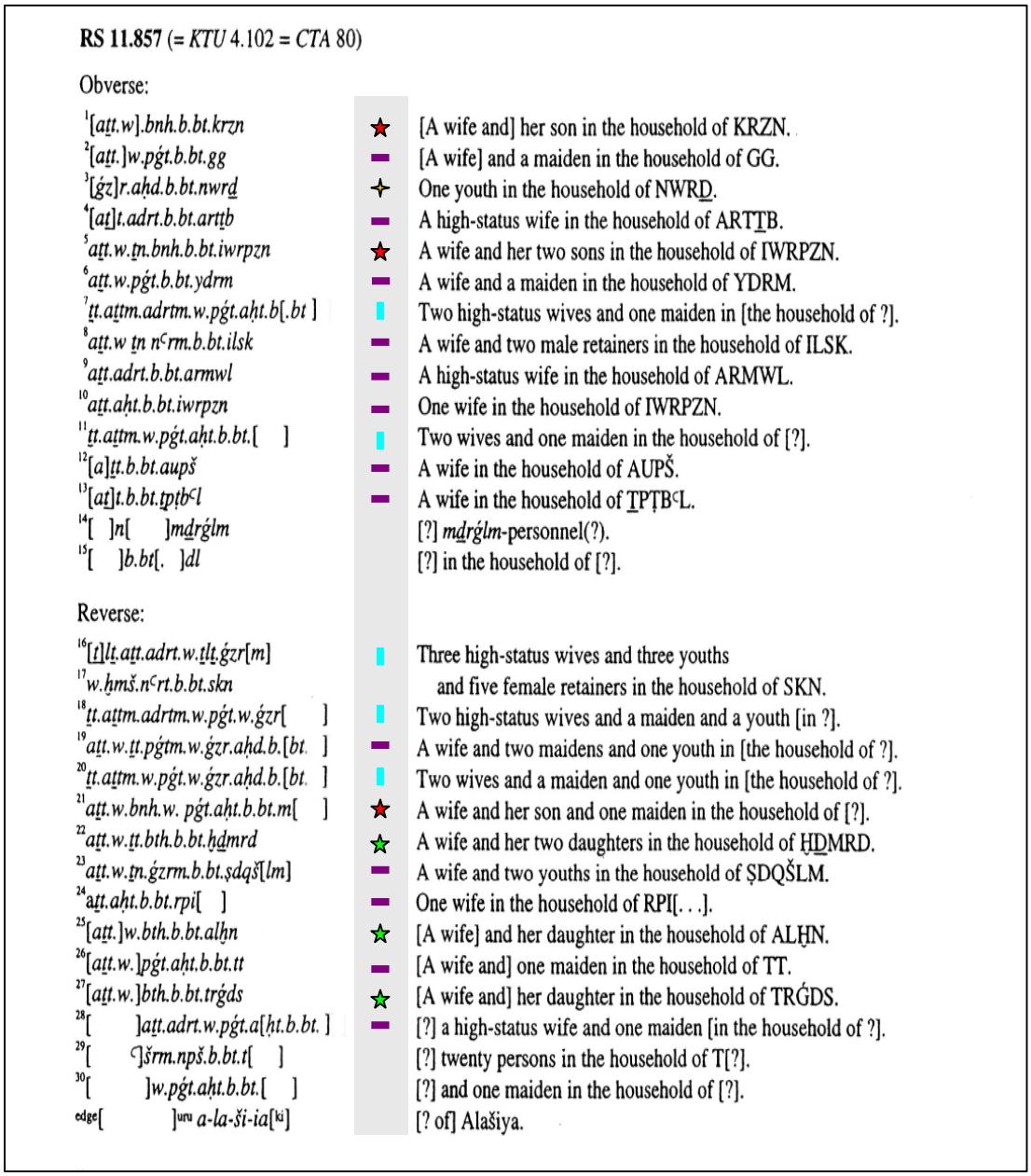
8.2.3 What we know about co-residential groups in the Cypriot Bronze Age

Before investigating what residences can tell us about co-residential group composition, attention should be drawn to what little is known from textual evidence. The native script of Cyprus remains un-deciphered; however, official letters and administrative texts written in various known languages and scripts have been found in surrounding countries containing references to *Alashiya* or **Kupros*, which are thought to be names for Cyprus (Knapp (Ed.) 1996).

One such document (RS 11.857) dates to the 14th or 13th century BC and comprises a list of thirty groups of people headed either by Cypriot men living in Ugarit on the Syrian coast, or by men of Ugaritic origin living in Cyprus (Walls 1996: 40). It is not known what these groups represent, but as with census returns in family history, it is likely that these groupings are equivalent to, or coterminous with, co-residential groups.

Multi-conjugal groups feature quite prominently in the list (Figure 8.2). Several groups consist of co-wives, or of married sons or married daughters (when no sons exist), residing together with the head and his wife. All the recorded configurations are in keeping with the practice of a joint residential pattern (Schloen 2001: 323-6). Even if the people involved were from Ugarit rather than Cyprus, or were Cypriots who for some reason made unusual residential decisions, it could at least be argued that multi-conjugal occupancy was not completely alien to this region during the LC.

FIGURE 8.2 Ugaritic document listing groups of people headed by Alashiya men
(adapted from Schloen 2001: 324)



RS 11.857 (= *KTU* 4.102 = *CTA* 80)

Obverse:

[1] [aṯt.w].bnh.b.bt.krzn	★	[A wife and] her son in the household of KRZN.
[2] [aṯt.]w.pġt.b.bt.gg	▬	[A wife] and a maiden in the household of GG.
[3] [ġz]r.aḥd.b.bt.nwrḏ	✦	One youth in the household of NWRḎ.
[4] [aṯ]t.adrt.b.bt.artṯb	▬	A high-status wife in the household of ARTṮB.
[5] aṯt.w.ṯn.bnh.b.bt.iwrpzn	★	A wife and her two sons in the household of IWRPZN.
[6] aṯt.w.pġt.b.bt.ydrm	▬	A wife and a maiden in the household of YDRM.
[7] ṯt.aṯtm.adrtm.w.pġt.aḥt.b[.bt]	▮	Two high-status wives and one maiden in [the household of ?].
[8] aṯt.w ṯn nᶜrm.b.bt.ilsk	▬	A wife and two male retainers in the household of ILSK.
[9] aṯt.adrt.b.bt.armwl	▬	A high-status wife in the household of ARMWL.
[10] aṯt.aḥt.b.bt.iwrpzn	▬	One wife in the household of IWRPZN.
[11] ṯt.aṯtm.w.pġt.aḥt.b.bt.[ ]	▮	Two wives and one maiden in the household of [?].
[12] [a]ṯt.b.bt.aupš	▬	A wife in the household of AUPŠ.
[13] [aṯ]t.b.bt.ṭpṭbᶜl	▬	A wife in the household of ṬPṬBᶜL.
[14] [ ]n[ ]mḏrġlm		[?] *mḏrġlm*-personnel(?).
[15] [ ]b.bt[.]dl		[?] in the household of [?].

Reverse:

[16] [ṯ]lṯ.aṯt.adrt.w.ṯlṯ.ġzr[m]	▮	Three high-status wives and three youths
[17] w.ḫmš.nᶜrt.b.bt.skn		and five female retainers in the household of SKN.
[18] ṯt.aṯtm.adrtm.w.pġt.w.ġzr[ ]	▮	Two high-status wives and a maiden and a youth [in ?].
[19] aṯt.w.ṯt.pġtm.w.ġzr.aḥd.b.[bt.]	▬	A wife and two maidens and one youth in [the household of ?].
[20] ṯt.aṯtm.w.pġt.w.ġzr.aḥd.b.[bt.]	▮	Two wives and a maiden and one youth in [the household of ?].
[21] aṯt.w.bnh.w. pġt.aḥt.b.bt.m[ ]	★	A wife and her son and one maiden in the household of [?].
[22] aṯt.w.ṯt.bth.b.bt.ḥḏmrd	☆	A wife and her two daughters in the household of ḤḎMRD.
[23] aṯt.w.ṯn.ġzrm.b.bt.ṣdqš[lm]	▬	A wife and two youths in the household of ṢDQŠLM.
[24] aṯt.aḥt.b.bt.rpi[ ]	▬	One wife in the household of RPI[. . .].
[25] [aṯt.]w.bth.b.bt.alḫn	☆	[A wife] and her daughter in the household of ALḪN.
[26] [aṯt.w.]pġt.aḥt.b.bt.tt	▬	[A wife and] one maiden in the household of TT.
[27] [aṯt.w.]bth.b.bt.trġds	☆	[A wife and] her daughter in the household of TRĠDS.
[28] [ ]aṯt.adrt.w.pġt.a[ḥt.b.bt.]	▬	[?] a high-status wife and one maiden [in the household of ?].
[29] [ ]šrm.npš.b.bt.t[ ]		[?] twenty persons in the household of T[?].
[30] [ ]w.pġt.aḥt.b.bt.[ ]		[?] and one maiden in the household of [?].
edge[ ]^{uru} a-la-ši-ia[^{ki}]		[? of] Alašiya.

Note: the translation "son" or "daughter" refers to a married child, whereas a "youth" or "maiden" is an unmarried adolescent child. Prepubescent children and the spouses of married children are not recorded.

KEY

- ▬ one-conjugal group
- ★ multi-conjugal group containing head's married son or sons
- ☆ multi-conjugal group containing head's married daughter or daughters
- ▮ multi-conjugal group containing co-wives
- ✦ no-conjugal group

Despite this clue to co-residential group composition in the Bronze Age, only vague suggestions have so far been hazarded by archaeologists regarding the composition of co-residential groups. Karageorghis proposed that "a minimum of four to six persons" could have inhabited each of the LC residences in Pyla-*Kokkinokremos* (Karageorghis 1984: 24), whilst Åström based his population estimate for the community at Hala Sultan Tekke-*Vyzaja* on the assumption of ten inhabitants per residence (Åström 1986: 10). The earlier buildings of Marki-*Alonia* were estimated to house seven to ten inhabitants (Frankel and Webb 2001: 122), and those of Alambra-*Mouttes* in the MC were thought to have provided "abundant space for four or five people, and could well have accommodated even larger, extended, families" (Coleman 1996: 327). Swiny suggested that domestic units from the EC and MC "correspond to the space requirements of a nuclear family" (Swiny 1989: 21).

All these interpretations were made on the basis of the spatial attributes of residences, mainly their 'ground-plan areas'.[22] Given the paucity of documents on this subject, we have no choice but to rely on architectural evidence. However, there has been no large-scale systematic analysis of Bronze Age residences to date, either for this or any other purpose. Furthermore, neither of the two published overviews of the architecture of this period (Wright 1992; Swiny 1989) describes the full range of residential designs in existence, while Webb's recent overview focuses only on residences dating to the Early and Middle Bronze age (Webb 2009). The following section rectifies this omission, and establishes the sample of residences to be used in the investigation.

8.3 Cypriot Bronze Age residences

A substantial body of published work exists, mainly in the form of excavation reports, which describes the architectural remains from Bronze Age settlements on Cyprus. Our concern here is not to inventory every building or partially preserved structure used for domestic purposes, but to identify complete residences.

Three criteria were used to make this identification from the architectural plans of excavated settlements. A complete residence consists of a set of rooms which:

a) is interconnected, either directly or indirectly;
b) is delimited by walls belonging to other buildings, or public spaces such as roads or pathways; and
c) is domestic in character.

[22] Notably, only Frankel and Webb (2001) were explicit about their assumption that inhabitants needed an average of $10m^2$ of roofed floor-space per person.

Not every excavated site from the Bronze Age contains architecture that can be called 'domestic'. Some buildings are thought to have been forts or keeps, most famously that at Korovia-*Nitovikla* (Hult 1992) and the various examples around Ayios Sozomenos. At other sites, the only buildings that have been unearthed were fitted out with manufacturing facilities, as at Sanidha-*Moutti tou Ayiou Serkou* (Todd et al. 1991; 1992; 1993) and Pyrgos-*Mavrorachi* (Belgiorno 1999; 2000). All of the known LC buildings in Athienou-*Bamboulari tis Koukounninas* (Dothan and Ben-Tor 1983), Ayios Iakovos-*Dhima* (Gjerstad et al. 1934: 356-61), Ayia Irini (Gjerstad et al. 1935: 642-824), Idalion-*Ambelleri* (Gjerstad et al 1935: 460-628), Myrtou-*Pigadhes* (du Plat Taylor 1957), and possibly also Alassa-*Paliotaverna* (Hadjisavvas 1994), were associated with cultic activities (Webb 1999). The buildings so far exposed in Aredhiou-*Vouppes* (Steel and Thomas 2008), Phlamoudhi-*Melissa* (Smith 2008: 45-68, Karageorghis 1971: 406f., 1972: 1045ff., 1973: 638ff., 1974: 864f.) and Maroni-*Vournes* (Cadogan 1983; 1984; 1985; 1986; 1987; 1988; 1989; 1992; Cadogan and Domurad 1989) had specialist functions associated with large-scale storage and production.

Once those settlements have been excluded from consideration, 22 settlements remain which contain domestic architecture dating to the late third and second millennia BC (Table 8.1).

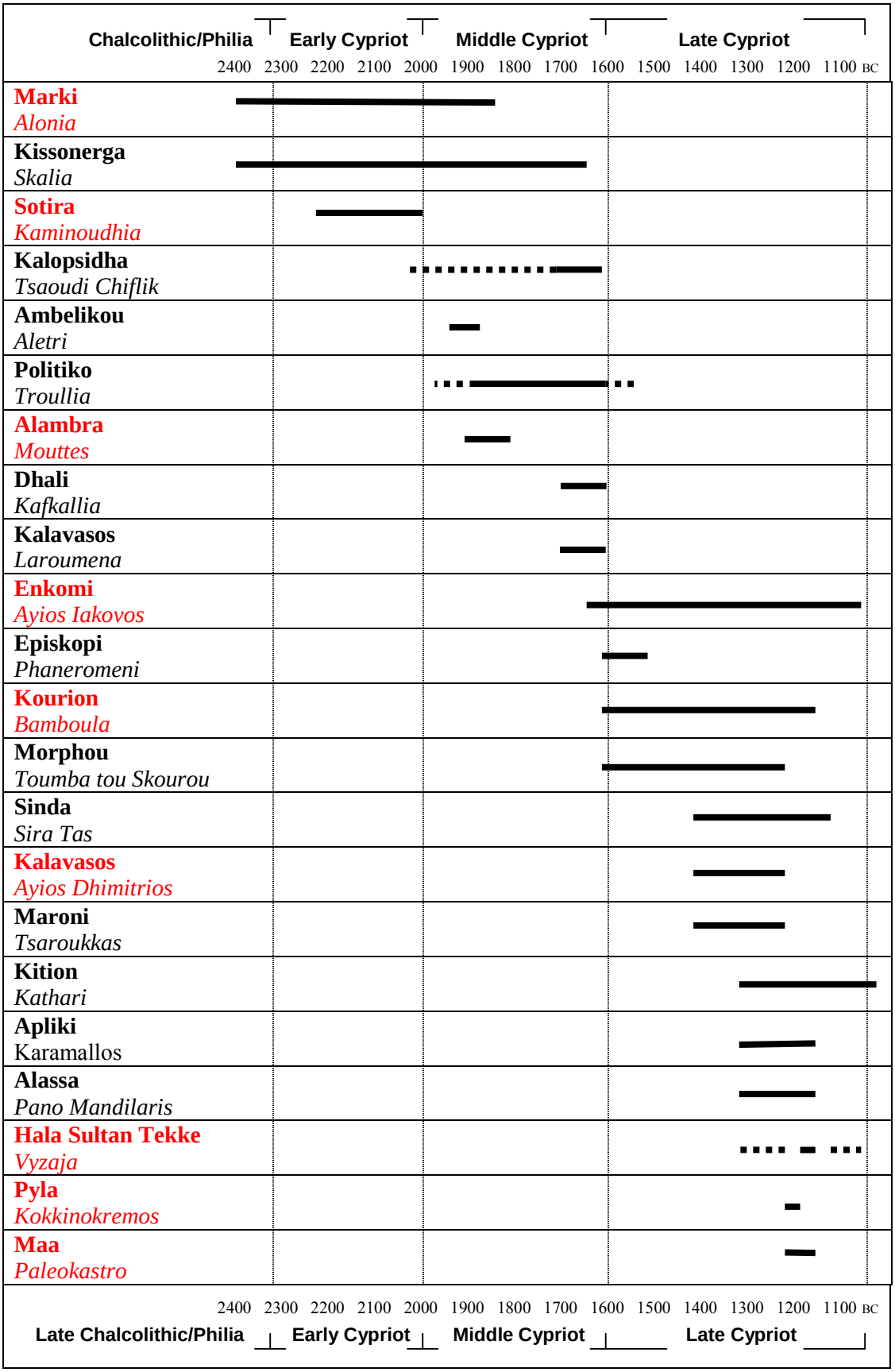
The architectural remains from the 22 settlements have several characteristics in common:

- rooms are rectilinear;
- each wall consists of several courses of stone or a carved bedrock ledge covered by a superstructure of mould-formed mudbricks;
- floor surfaces are made of earth or bedrock, less frequently of plaster or some form of paving; and
- rooms usually share party-walls.

Some of the thicker walls amongst the remains were structurally capable of supporting upper storeys. Although staircases are clearly evidenced in Enkomi-*Ayios Iakovos*, Hala Sultan Tekke-*Vyzaja*, and Kalavasos-*Ayios Dhimitrios*, their occurrence may have been much more widespread.

Amongst the architectural remains in the 22 settlements are also several examples of buildings constructed of ashlar masonry, all dating to the LC. Ashlar construction was used almost exclusively for exceptionally grand buildings believed to have had a 'public' character (c.f. Fisher 2009). Their function was administrative, industrial, storage-related or cultic, rather than domestic. If these buildings also provided accommodation then the co-residential groups occupying them were most probably unrepresentative of others in their communities. For this reason, they are not considered in this investigation.

TABLE 8.1 Occupation dates of Cypriot Bronze Age settlements



Note: the sites in red are those in which at least one complete residence has been recognised.

Complete residences could *not* be identified in 13 of the 22 settlements. A variety of reasons can explain this :

- The architectural remains at Dhali-*Kafkallia* (Overbeck and Swiny 1972), were exposed through erosion and ploughing rather than excavation. Because of this, many low-lying walls and room entrances may be missing from the settlement plan, and the illustrated ground-plans of most buildings cannot be trusted to be complete.

- The architectural finds from several sites have so far appeared only in preliminary excavation reports. From the published plans of Episkopi-*Phaneromeni* (Swiny 1986; Carpenter 1981; 1982) and Alassa-*Pano Mandilaris* (Hadjisavvas 1986; 1989; 1991), it is not always possible to tell whether walls existed contemporaneously, and whether interruptions in walls indicate entrances or instead resulted from stone robbing or illicit digging.

- In three of the sites where excavation is still in its early or preliminary stages, exposure has been too limited to allow the recognition of complete residences. This is true of Kalavasos-*Laroumena* (Todd 1993), Politiko-*Troullia* (Falconer et al. 2005; Fall et al. 2008) and Kissonerga-*Skalia* (Crewe et al. 2008; Crewe 2009).

- In several other sites, room clusters have been unearthed but none seems to form a clearly-bounded and internally coherent residence. This is true of Ambelikou-*Aletri* (Dikaios 1946), Sinda-*Sira Tas* (Furumark and Adelman 2003: 47-64), Morphou-*Toumba tou Skourou* (Vermeule and Wolsky 1990), Maroni-*Tsaroukkas* (Manning and Conwell 1992; Manning et al. 1994a; 1994b), and Kition-*Kathari* (Karageorghis and Demas 1985: 5-23).

- Sets of interconnecting rooms appear in Kalopsidha-*Tsaoudi Chiflik* (Gjerstad 1926: 27-37) and Apliki-*Karamallos* (du Plat Taylor 1952; Kling and Muhly 2007). However, in both cases, there are no roads or pathways delimiting the edges of the buildings, so it is not known whether each set of rooms forms a complete residence.

The nine settlements where residences have been identified are listed in red in Table 8.1, and their plans are shown in Appendix H. In all, 40 complete residences could be isolated amongst the architectural remains from the nine settlements. The ground-plans of the 40 residences are illustrated in Figures 8.3 and 8.4, and a concordance linking these residences with the primary publication record is given in Appendix G.

Forty may seem a surprisingly small number of residences to represent the whole of the Bronze Age. The paucity can be accounted for partly by the limited extent of the exposures at most of the sites. Some of the trenches in Kourion-*Bamboula* and Kalavasos-*Ayios Dhimitrios*, for example, were too small to permit the exposure of entire building complexes: in order to satisfy the criteria set out at the start of section 8.3, several large clusters of rooms that were interrupted by the edges of trenches or which were internally incoherent had to be discounted. Admittedly, this is a conservative approach, but one that is warranted given that the aim of this exercise is not to form a comprehensive inventory of domestic architecture *per se*, but to marshal the most robust evidence available from the Bronze Age Cypriot archaeological record to explore the feasibility of inferring living arrangements from excavated residences.

A further impediment to the identification of residences is incomplete publication. For instance, despite extensive exposure, only one residence from Hala Sultan Tekke-*Vyzaja* has yet been published; nevertheless, the plan of the site (Figure H.6) is sufficiently clear to allow two more residences to be distinguished (although we cannot be sure whether their walls belong to one or more occupation phases).

The most extensively excavated site in Bronze Age Cyprus is Enkomi-*Ayios Iakovos* (Figure H.8), which was unearthed over several decades prior to 1974 by the French Mission and the Cypriot Department of Antiquities, but which still remains woefully under-published (Crewe 2007: 69-71). The plans in Courtois et al.'s volume (1986) reveal contiguous buildings along street fronts in several neighbourhoods, but the drawings conflate multiple building phases, while the text provides minimal guidance to help resolve ambiguities regarding phasing and the contemporaneity of walls. These poorly understood and unclearly delimited buildings have therefore been set aside, in favour of the meticulously recorded buildings in the north part of the site, which were excavated and published by Dikaios (Dikaios 1969-71), and recognised as independent residences by Pickles and Peltenburg (1998). Other well published areas in the settlement are generally thought to be non-domestic (e.g. Dikaios' Area I, Batîment 18, and the Sanctuary of the Ingot God), and so were excluded here.

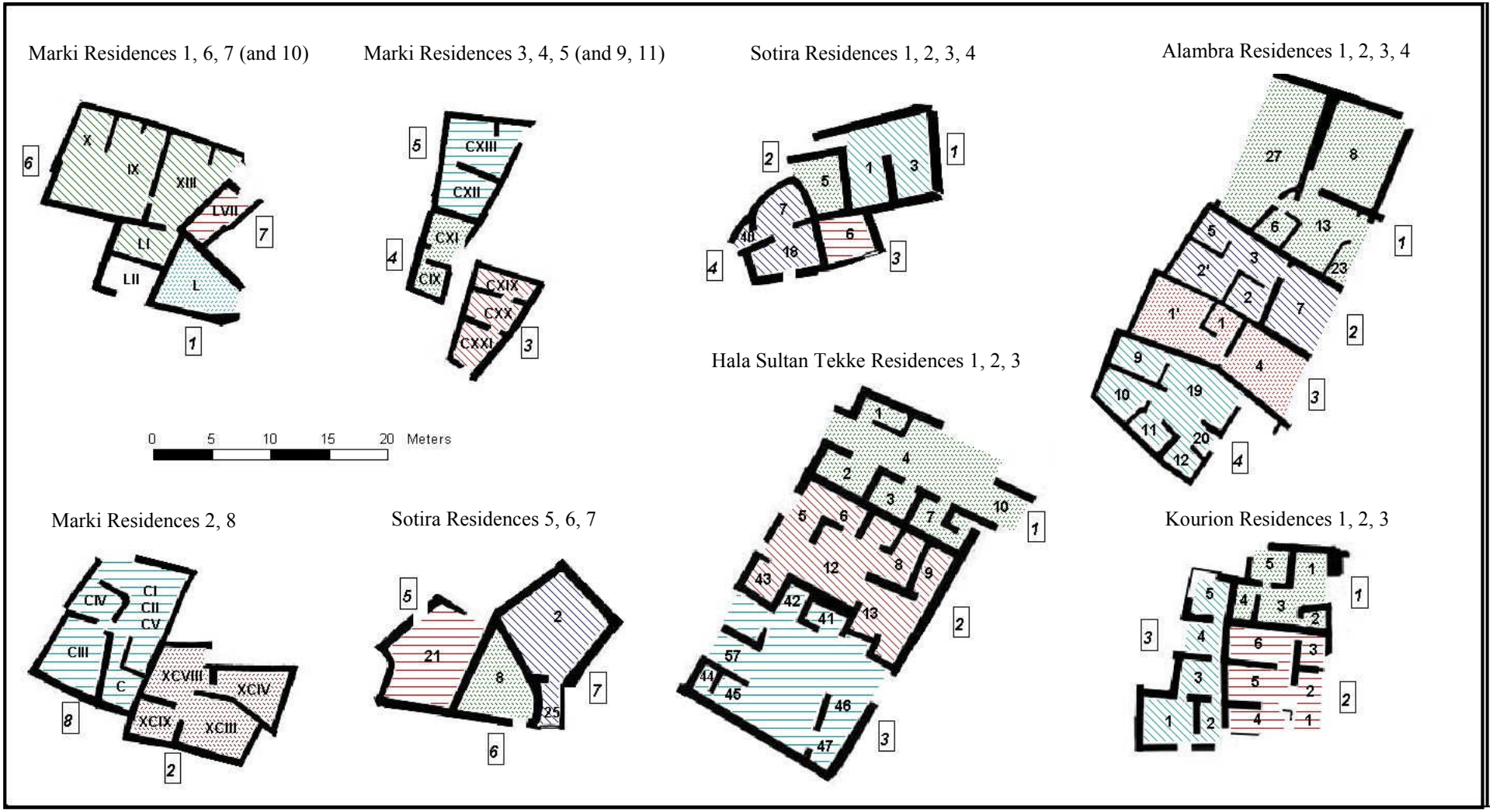


FIGURE 8.3 Plans of residences in Marki-Alonia, Sotira-Kaminoudhia, Alambra-Mouttes, Kourion-Bamboula and Hala Sultan Tekke-Vyzaja.
For the location of each residence, see Appendix H.

FIGURE 8.4 Plans of residences in Kalavasos-Ayios Dhimitrios, Pyla-Kokkinokremos, Enkomi-Ayios Iakovos and Maa-Paleokastro.
For the location of each residence, see Appendix H.

8.4 Problems in the recognition of room function

In Chapter 6 it was suggested that in order to deduce demographic information about the occupants of residences we need to enumerate 'actual sleeping spaces' and 'cooking spaces', and to calculate the amount of 'dwelling area' in each residence. To enable this in the case of the 40 Cypriot residences, the function of individual rooms must first be inferred.

There are serious difficulties involved in recognising the functions of rooms and the aim of this section is to explain how these difficulties arise. Essentially they stem from two sources: abandonment and post-abandonment events and processes. The first subsection discusses how factors associated with abandonment can impede the recognition of a room's function. The second subsection describes the types of occurrence that can add to, displace, or deplete the contents of rooms after residences have been abandoned, complicating the identification of room function.

8.4.1 The effects of abandonment

One might suppose that the items found within an excavated room would provide an accurate indication of how the room was used by its occupants. Interpreting a room's contents, however, is not as straightforward as early generations of archaeologists assumed.

Prior to the major shifts in archaeological thinking that took place in the 1970s, little thought was put into the ways in which assemblages (i.e. groups of objects recovered from archaeological contexts) had formed. Items found on or above floor surfaces were assumed to be in the approximate positions in which they were used or stored during the rooms' occupation.

Where rooms have undergone sudden devastation and have remained relatively untouched since their initial occupation, there is sometimes good reason to believe that this is true. More often, however, events and processes that occurred around the time of abandonment or thereafter have altered the contents of rooms. Where this has been the case, it has confounded the identification of room function.

The examples below illustrate how a sudden abandonment and an orderly abandonment of a residence can affect the interpretation of room function.

Example 1: Sudden abandonment (Figure 8.5)

'House A' at Apliki-*Karamallos* was a building that functioned, at least in part, as a communal storehouse during LCIIC (Keswani 1993: 77). When its rooms were excavated, large numbers of objects were discovered on the floors surrounded by thick and extensive layers of ash and the remnants of charred timber beams. The rooms are therefore thought to have been destroyed by fire (du Plat Taylor 1952; Kling and Muhly 2007).

While some of the objects caught in the fire may have been knocked out of the positions in which they were habitually used and stored, they nevertheless formed coherent assemblages. The assemblages in each room could be used to infer that room *1* was dedicated to large-scale or long-term food and drink storage; that room *3* and the eastern side of room *5* were used as repositories of provisions and tools; that room *3W* functioned as an all-purpose storeroom, used also as a reserve for tableware; and that room *2* served (perhaps mainly after the fire destruction) for the temporary placement of miscellaneous items awaiting relocation, disposal, repair or reuse.

The fact that the building underwent sudden devastation did not mean that all its contents remained undisturbed in their original positions. The pit in room *3* (du Plat Taylor 1952: 135, figure 4) and the near-absence of intact artefacts, particularly metal ones (ibid. 163), suggest that efforts were made to recover salvageable items before the destabilised roof gave way. The reason why room functions can be identified in 'House A' is that the occupants must have deemed many of its contents unworthy of removal, probably because of their damaged condition. Moreover, the ruins were never reoccupied or built over, and erosion, slope-wash, and the construction of a modern roadway only affected localised parts of the site while leaving other rooms untouched. Thus, sufficient evidence was left in place, undisturbed by later events, to permit the identification of how the rooms had been used immediately prior to the fire destruction.

The situation at Apliki is rare: most Cypriot Bronze Age residences did not suffer sudden devastation but were abandoned in a premeditated and orderly way. The majority of their portable contents would have been intact and still usable at the time of abandonment, and were therefore removed by their inhabitants. Only items that were too heavy to carry, easily replaceable at the point of destination, or already defunct were left behind (cf. Webb 1995; 1998). As a result, most traces indicating how the rooms were used during their occupation were removed.

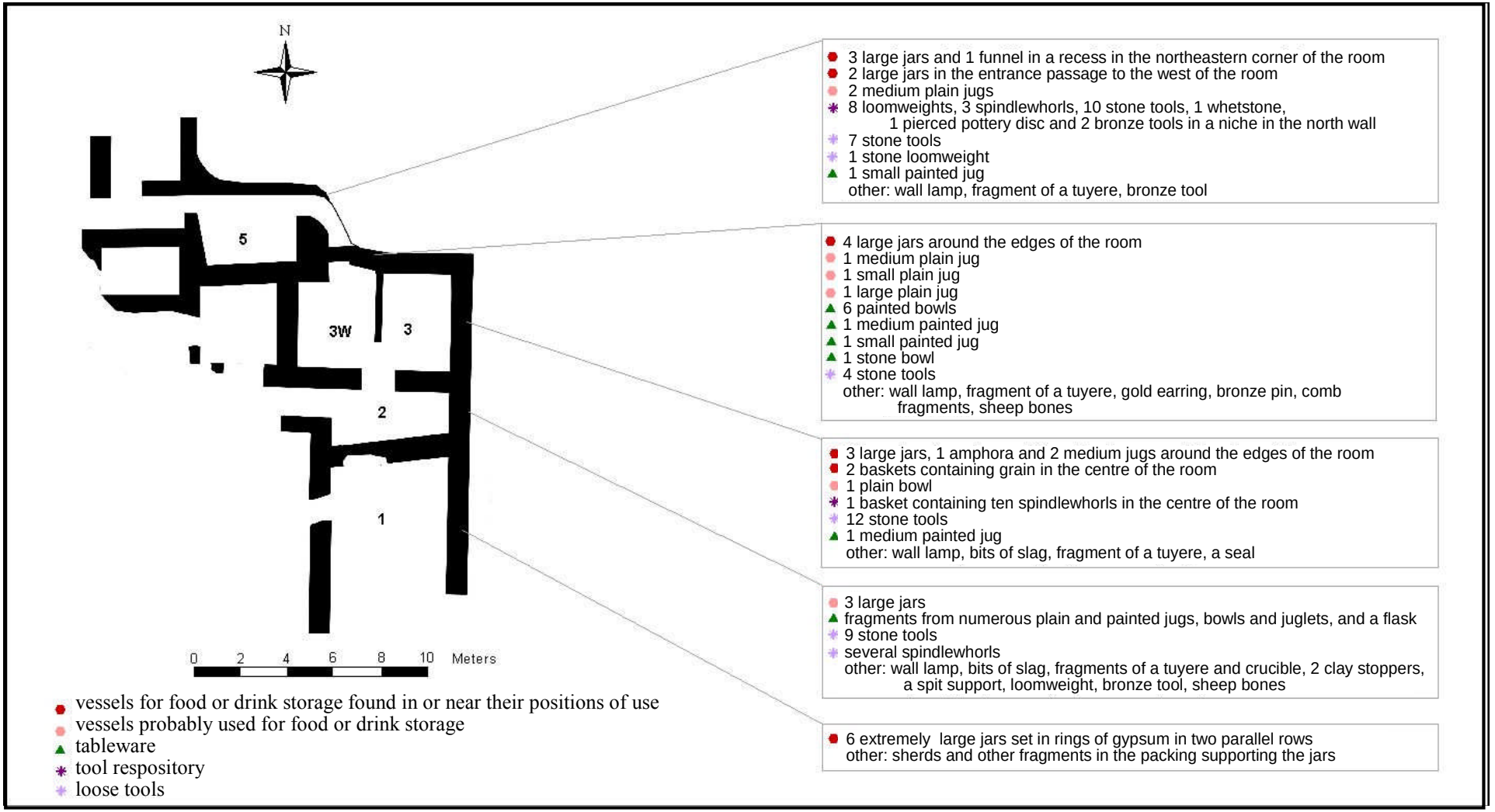


FIGURE 8.5 Plan of the architectural remains at Apliki-Karamallos ('House A'), with a list of the finds from each room

Example 2: Orderly abandonment (Figure 8.6)

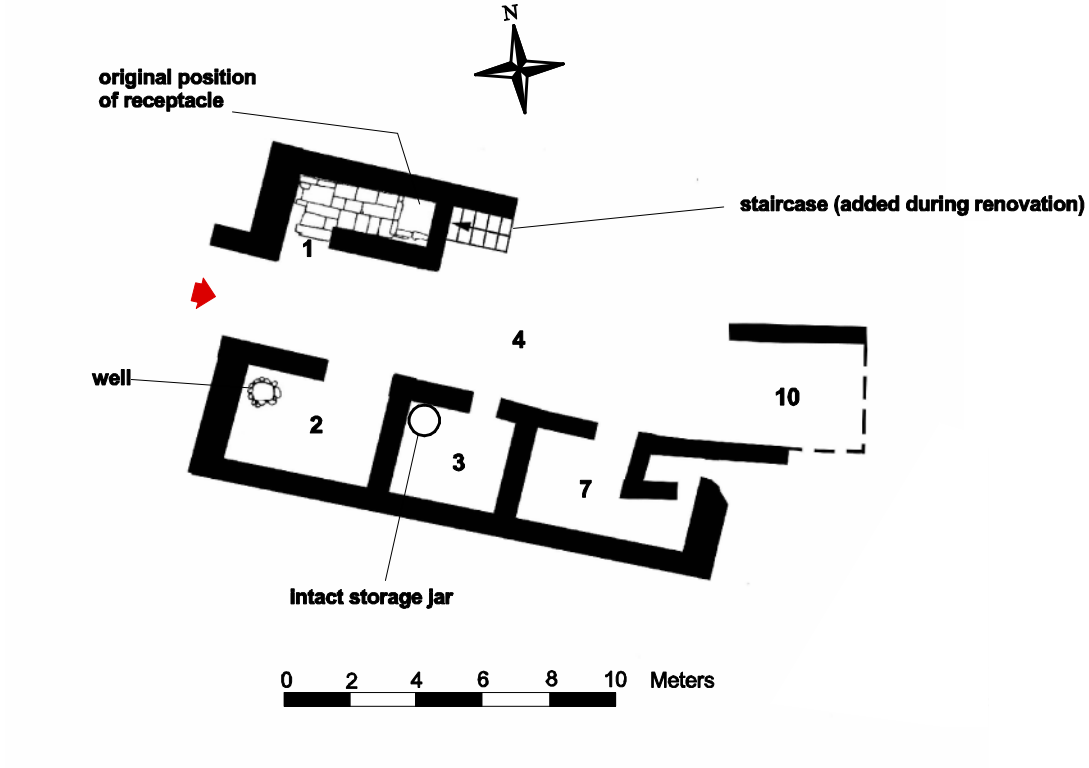
Residence 1 at Hala Sultan Tekke-*Vyzaja* contained no signs of destruction (Hult 1978, 1981). Excavation exposed very little material in rooms *3*, *4* and *7*, apart from a few scattered fragments of objects that could not be reconstructed. The paucity of finds in most of the rooms may have resulted from the removal of objects during the abandonment process. This is suggested by the discovery of only one intact item: a storage jar embedded in the floor in the corner of room *3*. This was sufficiently large for its owners to deem it too cumbersome to remove and transport when they were vacating the premises.

The abandonment process was particularly apparent in Room *1*. While the residence was occupied, this room had a receptacle buried on its eastern side adjacent to the stone paving, suggesting it either functioned as a bathroom (Hult 1978: 30), or as a treading surface for the production of olive oil or wine (cf. Frankel 1999). The receptacle, or its contents, must have been precious enough for the occupants to take with them, as at some point it was removed leaving a hollow that was over 2m deep. The hollow was found filled with broken pottery and other small or damaged items whose nature was clearly incompatible with the room's regular use. Its mixed and fragmentary nature identifies it as refuse, which was apparently discarded in one go, suggesting it may have been dumped in the hollow in the last few days of occupation when normal procedures for disposing of rubbish may have ceased (cf. Stevenson 1982: 252).

The rich accumulation of finds in room *2* seems at odds with the paucity of finds in the rest of the residence. However, this material has nothing to do with the room's occupation. This is indicated by the position of the material amid the remnants of the collapsed walls; the presence of burnt debris and human remains in the well, which would have contaminated its water (Åström 1998: 7ff.); the mixed nature of the material; and the small size and damaged condition of the non-ceramic items. It is quite probable that this room was stripped as bare as the others during the process of abandonment, and that rubbish was dumped into the room after the residence had already become a standing ruin.

The paucity of finds in most of the rooms and the deposition of rubbish in some meant that, in this instance, assemblages could not be used to infer room functions.

FIGURE 8.6 Plan of residence 1 at Hala Sultan Tekke-*Vyzaja*



8.4.2 The effects of post-abandonment events and processes

Various occurrences may befall a residence after its abandonment. It is worthwhile talking through these, as they played a considerable role in the formation of the Cypriot archaeological record. Worryingly, their effects continue to be overlooked to some extent even in current research (Knapp 1999: 79f).

If a residence is not reoccupied soon after it is abandoned, then in many cases it continues to stand as an empty shell, inviting various uses. If there are people living or working in its vicinity, parts of it can act as stables, storerooms, toilets, temporary accommodation for squatters, or simply as convenient locations for fly-tipping (though all these possibilities may be limited if access rights exist and are respected). Any of these activities are likely to displace the residence's few remaining contents from the positions where their inhabitants left them, or to introduce new material which may remain in the residence once the period of reuse has ended. Such activities can be hard to distinguish from occupation, but some residues – such as disarticulated human remains in the fill of a room (e.g. in Marki Residence 7) or patches of burning on or above floors (e.g. in Alambra Residence 4) – are fairly secure indications of dumping and squatting respectively.

Gradually the structure of the residence weakens and begins to collapse; however, it can remain visible as a standing ruin for decades or even centuries, depending on the local topography. At Pyla and Maa, perhaps more than anywhere else, there was practically no possibility of soil being washed onto the ruins by rain or erosion so there was little to cover the stone wall foundations from view aside from the fallen and disintegrating mudbrick of their superstructure. By remaining visible, the residences in those sites may have been particularly prone to reuse or disturbance.

During this time, the activities listed above may continue to take place within and around the standing wall stumps, and in fact become increasingly likely as property rights are progressively relaxed and eventually lost beyond recall. Travellers may use the ruin expediently for overnight or short-term shelter, and perhaps a formal or informal burial may take place amongst its collapsed remains, as occurred in Hala Sultan Tekke Residence 3. Such events can displace original contents.

Alternatively, material may be scavenged from a residence to be used for construction purposes: timber from roofs and doors may be reused, stones from its foundations or even stone artefacts collected from its rooms can be incorporated into new walls, while debris dug out of rooms (containing artefacts, sections of flooring, and disintegrated walls and roofing) can serve as levelling deposits beneath floors, or raw material in the production of new mudbricks.

Looters may take an interest in the ruin's antiquity and try to recover artefacts from within it, targeting those of perceived value. Missing walls, and pits like those found at Kourion Residence 3, may be testaments to such activities. Their result is a further depletion or disarrangement of the artefacts left behind by the occupants.

Another possibility that can occur at any point after occupation ends is that new construction may take place on top of the residence's remains. This can potentially cause all manner of disturbance to the rooms and the objects they contained at the time of abandonment. Extraneous material may be introduced onto the floors as levelling fill, and existing floor deposits can be moved from one side of a room to another, or to other rooms, in order to even out the fill. Sometimes entire floor surfaces and the objects on them may be scooped out so that a new floor can be laid at a similar or lower level to the previous one; alternatively, the extraction of material may be more localised, for example when trenches are made for new wall foundations, or when fresh wells are dug (as in Enkomi Residence 1).

Aside from all this, there is a host of activities and conditions that can damage a residence both before and after its remains become entirely hidden underground. Ploughing (e.g. in Sotira Residence 1), or the levelling or terracing of the landscape for agricultural purposes (as in Alambra Residence 1), may inadvertently remove walls, floor surfaces, and the objects on them. In residences situated on sloping terrain, artefacts can be washed away by rainwater or become displaced through erosion. Root growth and animal burrowing may also shift artefacts out of position across smaller distances.

Even one such post-abandonment occurrence can significantly transform the contents of a room (Schiffer 1976: 27-41). As shown in Table 8.2, most of rooms in the 40 Cypriot residences have been affected by at least one event or process which has added to, displaced, or depleted its contents. While it is true that some spaces escaped relatively unscathed,[23] this seems to have been the exception. Disturbance is apparent even in some of the rich floor deposits left behind during the catastrophic event that took place at Enkomi at the end of LCIIC (contra Antoniadou 2005: 68). All of this has serious implications for the recognition of room function.

[23] This is most obvious in a couple of rooms in Alambra: the western side of room *8* in Residence 1, and room *1* in Residence 3. For unknown reasons, little was removed from these rooms at the time of abandonment. When uncovered by excavation, groups of intact objects were found close to the positions where they were likely to have been stored during occupation.

TABLE 8.2 Post-abandonment formation processes in forty Cypriot Bronze Age residences

Residence		Date of occupation	Displacement of floor deposits	Removal of floor deposits	Introduction of extraneous material onto floor deposits	Disturbance of floor deposits by subsequent construction	Incomplete excavation of floor deposits
Marki	1	ECIII				new floor overlaid during MCI-II, associated with a change in room function	
	2	ECIII		pit in centre of unit *XCIV*	body deposited in unit *XCVIII* following its structural collapse	new walls added in units *XCVIII* and *XCIX*; new floor overlaid in unit *XCVIII* to create an enclosed room	
	3	ECIII				new floors overlaid in unit *CXXI* at later stage of ECIII to create Residence 9, and in units *CXX* and *CXIX* to create rooms belonging to an adjacent residence; Iron Age ditch cut through unit *CXIX* and N area of unit *CXX*	
	4	ECIII				deliberate demolition of unit *CIX*; Iron Age ditch cut through unit *CXI*	
	5	ECIII		medieval pit cut in S part of unit *CXII*		new walls added and floor overlaid in unit *CXIII* at later stage of MCI-II to create Residence 11	
	6	MCI-II			body deposited in SE corner of unit *XIII* following its structural collapse	small structure built over N area of units *X* and *IX* at a later stage of MCI-II; new floor overlaid in unit *LI* at later stage of MCI-II to create part of Residence 10	
	7	MCI-II		clearance of entire floor surface	rubbish dump which includes disarticulated human remains		
	8	MCI-II		plough disturbance in N region of residence		modern road built over N region of unit *CII*	
	9	MCI-II		plough disturbance			
	10	MCI-II					
	11	MCI-II		plough disturbance		modern road built over N region of unit *CXII*	

Residence		Date of occupation	Displacement of floor deposits	Removal of floor deposits	Introduction of extraneous material onto floor deposits	Disturbance of floor deposits by subsequent construction	Incomplete excavation of floor deposits
Sotira	1	ECIII		ploughing has probably removed the entire floor surface*			
	2	ECIII	tree root disturbance				
	3	ECIII	tree root disturbance	pit in SW corner	rubbish dump which includes disarticulated human remains		
	4	ECIII	tree root disturbance, particularly in SE corner of unit *7*	pit in SE corner			in unit *18*, where excavation ceased once the tops of the surviving wall stumps were revealed
	5	ECIII					in the S and W region, where excavation ceased once the tops of the surviving wall stumps were revealed
	6	ECIII					
	7	ECIII		ploughing has probably removed the entire floor surface**			
Alambra	1	MCII	erosion in room *23* and the E corner of the residence near the edge of the ravine; slope-wash action from the high W region to the lower E region of the residence, particularly affecting room *27* whose E wall is preserved at a lower level than the floor	terracing within room *27* may have removed much of its floor surface (evidenced by a terrace wall with just one face built on the level of the bedrock)			
	2	MCII	erosion in the SE region of room *7* near the edge of the ravine; slope-wash action from the high NW region to the lower SE region of the residence, particularly affecting room *2'* whose E wall is preserved at a lower level than the floor		possible squatting in rooms *3* and *2* (evidenced by areas of burning on the bedrock surface)		

Residence		Date of occupation	Displacement of floor deposits	Removal of floor deposits	Introduction of extraneous material onto floor deposits	Disturbance of floor deposits by subsequent construction	Incomplete excavation of floor deposits
Alambra	3	MCII	erosion in the SE region of room *4* near the edge of the ravine		possible squatting in room *1'* (evidenced by patches of burning on the bedrock surface) and in room *1* (evidenced by a fire-blackened jar base found within a built pot emplacement)		
	4	MCII	slope-wash action from the high W region to the lower E region of the residence, particularly affecting room *11* (whose E wall is preserved only up to the level of the floor) and rooms *12* and *20*		possible squatting in room *9* (evidenced by patches of burning on the bedrock surface and in a built pot emplacement, and other burnt sherds throughout the room)		
Enkomi	1	LCIIC				new floor overlaid during LCIIIA; well cut into room *85* in LCIIIB	
	2	LCIIC		pit in the N part of room *19* (shown in Dikaios 1969-71: section 7); pit in N part of room *20* (ibid. section 9); pit in centre of room *26* (ibid. section 46)		new floor overlaid during LCIIIA with particular damage to rooms *2A*, *2B*, *2C*, *3A*, *3B* and *3C*; well cut into room *12A* during LCIIIA (shown in Dikaios 1969-71: section 23); later wells cut into a corridor to the E of room *32B* (ibid. section 9) and into room *5* (ibid. section 46)	
	3	LCIIC				new floor overlaid during LCIIIA	
	4	LCIIC		pit in centre of room *42* (shown in Dikaios 1969-71: section 37)		new floor overlaid during LCIIIA	
Kalavasos	1†	LCIIC					in the E half of room *30*, where excavation ceased at the level of a few large flat stones directly overlying the floor

Residence		Date of occupation	Displacement of floor deposits	Removal of floor deposits	Introduction of extraneous material onto floor deposits	Disturbance of floor deposits by subsequent construction	Incomplete excavation of floor deposits
Pyla	1	LCIIC	erosion in room *27* near the edge of the plateau			possible ephemeral structure built in SW region after the residence's structural collapse, reusing some surviving wall stumps (evidenced by aligned postholes in room *19*, and the clearing away of wall remains from the SW and their deposition in the E and N parts of residence)	in rooms *12*, *20* and *32*, where excavation did not proceed below the level of the rubble wall collapse except in a test pit in the passage between the two latter rooms
	2	LCIIC		pit in room *5*, which was partly back-filled with material removed from room *13* (evidenced by the presence of sherds belonging to crater 12/25 both in this pit and in room *13*); pits in room *22*	metallic scrap buried in a shallow pit in room *22* may have been collected from the ruins by looters and discarded as unworthy of removal	possible ephemeral structure built in central region after the residence's structural collapse, reusing some surviving wall stumps (evidenced by one line of postholes in room *13* and a perpendicular line in rooms *13* and *9*, including the posthole shown in Karageorghis and Demas 1984: section 2)	in rooms *5* and *11*, where excavation did not proceed below the level of the wall collapse (evidenced in room *5* by the two neat courses of fallen mudbricks observed at that level, and in room *11* by the mixture of rubble and mudbrick shown lying above the floor in Karageorghis and Demas 1984: section 7)
	3	LCIIC		pit in SW corner of room *8*	probable rubbish dump in western doorway of room *7*; possible squatting in room *2* (evidenced by burning on the bedrock surface against the N wall)	possible ephemeral structure built in S region after the residence's structural collapse, reusing some wall stumps (evidenced by aligned postholes in rooms *4* and *8*)	in area to the W of rooms *6*, *7* and *8*
	4	LCIIC			possible squatting in rooms *24* and *28* (evidenced by areas of burning on the bedrock surface)		

Residence		Date of occupation	Displacement of floor deposits	Removal of floor deposits	Introduction of extraneous material onto floor deposits	Disturbance of floor deposits by subsequent construction	Incomplete excavation of floor deposits
Hala Sultan Tekke	1	LCIIIA	tree root disturbance in room 4	pit in NE part of room *7;* plough disturbance in NE region of the residence, particularly affecting room *10*	rubbish dump in room *2* (evidenced by the accumulation in its well, which includes human remains); possible squatting in room 4 (evidenced by the flattening of the collapsed staircase, and patches of burning on the bedrock surface)		in room *2*, where excavation ceased 20cm above the floor except in a test pit against the N wall; in room *3*, where excavation ceased 15cm above the floor except in a test pit in the NE corner
	2†	LCIIIA					
	3†	LCIIIA			burial in N side of room *41* after its structural collapse; possible squatting in room *44* (evidenced by apparent reuse of a well as a toilet)		
Kourion	1	LCIIIA		pit in centre of room *2*; pit near NW wall of room *1*; pit in W corner of room *5*		new floor overlaid at later stage of LCIIIA (this building phase is associated with the blocking of the doorways from room *3* to rooms *4* and *5*)	
	2	LCIIIA		pit near SE wall of room 5		new floors overlaid in rooms *4*, *5* and *6* at later stage of LCIIIA; Archaic period cuttings were made in the E region of the residence in connection with the construction of a circuit wall, particularly affecting room *1*, the S part of room *4*, and the E sides of rooms *2*, *3* and *5*	
	3	LCIIIA		pit in doorway between rooms *2* and *3*; pit near NE wall of room *1* (shown in Weinberg 1983: plate 4d); walls robbed from rooms *5* and *4*, with possibly some removal of adjacent floor surfaces		new floors overlaid in rooms *1*, *2*, *3* and *4* at later stage of LCIIIA; an Archaic period cutting made in connection with the construction of a circuit wall affected the E corner of room *2*	

Residence		Date of occupation	Displacement of floor deposits	Removal of floor deposits	Introduction of extraneous material onto floor deposits	Disturbance of floor deposits by subsequent construction	Incomplete excavation of floor deposits
Maa	1	LCIIIA	erosion in room *20A*				
	2	LCIIIA		pit in N area of room *57*; pit in doorway between rooms *57* and *58*; pit in S corner of room *58*; pit in W half of room *56* and E edge of room *57*; E wall of room *56* robbed, with possibly some removal of adjacent floor surface		room constructed at a later stage of LCIII over most of room *62* and N half of room *60A*	
	3	LCIIIA		pit in NE corner of room *67* and W edges of rooms *64A* and *65A*; pit in NW corner of room *67*, pit in entire W half of room *69*; pit in doorway between rooms *69* and *68A*			

Notes for Table 8.2

- Displacement: the effects of non-human activities and natural processes such as erosion, which result in the movement or loss of artefactual evidence.

- Removal: any human agency resulting in the localised extraction or disappearance of a room's flooring and/or of the artefactual material on or above floors.

- Introduction of extraneous material: any human agency which has led to the addition onto or above a floor of material which does not belong to the room's systemic context, including evidence of squatting (though note that squatters would probably also be responsible for displacing and removing *de facto* material).

- Disturbance: the effects of episodes of construction subsequent to the main period of occupation.

- The 'room' or 'unit' numbers referred to in the table are those assigned by the relevant excavators. Their positions are shown in the residence plans in Figures 8.3 and 8.4.

- Any dates given in the table refer to pottery phases in the Early, Middle and Late Cypriot Bronze Age.

- The abbreviations 'N', 'S', 'E' and 'W' refer to the four cardinal points.

† Stratigraphy not yet been published in full.

* Two floors and occupational phases were identified by the excavator in Sotira Residence 1, but the latest walls seem to belong to a high third floor which has disappeared. In my opinion, the earliest bedrock floor ('floor 2') has no associated surviving architecture. The floor built above it ('floor 1') runs up against two bonding segments of stone walling in the north and east, and another wall segment on the west, which, perhaps together with wall WQ on the south, formed the boundaries of that room but were erroneously labelled by the excavator as 'benches'. The third building phase, associated with a floor which is now missing, involved the collapse or partial demolition of the north, east and west walls (leaving wall stumps that were interpreted as 'benches'), erecting new walls WB, WI and WM on the bedrock adjacent to them, constructing partition wall WE on top of the previous floor surface, then filling the room with packing up to the tops of the wall stumps in order to create the new floor surface. Hence the many stone tools and fragmentary objects on and above 'floor 1' may be in situ collapsed wall material and introduced construction fill rather than remains from the residence's second occupational phase.

**A single floor and occupational phase was identified by the excavator in Sotira Residence 7, but the latest walls seem to belong to a higher, later floor which has been removed by ploughing. In my opinion, the earliest bedrock floor is associated with the bonded segments of walling remaining in the northeast and southeast sides of the room and labelled by the excavator as 'benches'; these later collapsed or were partially demolished, new walls WJ and WA were erected adjacent to them, and packing laid over the bedrock and wall stumps to create a new floor surface which has since disappeared. The dense material found on and above the bedrock may therefore be construction fill.

8.5 Room function in the residences of Bronze Age Cyprus

In view of the abandonment and post-abandonment processes described above, is it possible to recognise 'actual sleeping spaces', 'cooking spaces' and 'dwelling area' in the 40 Bronze Age Cypriot residences? This section explores what we can infer about room function from room assemblages, from the architectural characteristics of the rooms, and from room fixtures.

8.5.1 Recognising room function on the basis of room assemblages

Archaeologists tend to rely on the assemblages found within rooms to interpret how the rooms were used during their occupation. As discussed, the process of abandoning a residence and a range of post-abandonment events and processes contribute to the formation of those assemblages, so that very often the collection of objects in a room can be misleading. This fact is particularly relevant when it comes to the recognition of 'actual sleeping spaces'.

In Bronze Age Cyprus, as in many other archaeological contexts,[24] beds and bedding would almost certainly have been made of organic materials. Although these cannot survive preservation, the places where they stood should theoretically be marked by the *absence* of any material or fixtures. It would be rash, however, to interpret the absence of archaeological material in a room as an indication of its function as sleeping accommodation. Unless there was cause to leave a residence in great haste and not return, inhabitants would have removed most of their portable possessions as part of a pre-planned abandonment operation. This, and the accumulation of fill or rubbish in other rooms after a residence's abandonment, can create the illusion that some rooms were emptier than others whilst the residence was occupied, so that they falsely appear to archaeologists as good candidates for 'actual sleeping spaces'.

The process of abandonment left most rooms in the 40 residences with only a minimal selection of the objects that had existed there during occupation, and post-abandonment events disrupted these and often added other, extraneous material. Because of this, it has not been possible to identify sleeping accommodation with any confidence in any of the 40 residences on the basis of artefact assemblages.

8.5.2 Recognising room function on the basis of architectural characteristics

The architectural characteristics of rooms and their location within the residence can assist in the recognition of room function. For example, certain rooms can be eliminated as candidates

[24] With notable exceptions, including Neolithic Skara Brae (Childe 1931: 14ff.) or Çatalhöyük (Düring 2001: 5), where built platforms are thought to have served as sleeping surfaces.

for regular sleeping accommodation because they were unroofed (e.g. room *22* in Pyla Residence 2), or completely taken up by a staircase (e.g. possibly room *18* in Pyla Residence 1) or by industrial installations (e.g. room *1* in Enkomi Residence 3). Others clearly served as small entrance vestibules (e.g. room *40* in Sotira Residence 4) and should therefore be discounted from the measurement of 'dwelling area'.

8.5.3 Recognising room function on the basis of room fixtures

Perhaps the most useful indicator of function is the presence in a room of some sort of built facility used to provide heat for cooking operations. Hearths or ovens, by virtue of being immovable, have a greater chance than portable artefacts of remaining *in situ* whilst abandonment and post-abandonment events unfold around them. Those that occur in enclosed spaces can serve to identify 'cooking spaces'.

Fixed hearths occur on sites from the EC, MC and LC, suggesting that they were constructed throughout the Cypriot Bronze Age period. It may therefore occasion some surprise that they are absent in over half of the 40 residences. Their absence in so many of the buildings may be explained in two ways.

One likely explanation is that post-abandonment processes have destroyed some hearths. Ploughing may have stripped them away, together with the floors on which they were built; the digging of pits, for whatever reason, may have demolished and removed them; or they may have been deliberately razed to the ground before a new floor surface was laid as part of a subsequent episode of construction. Exposure to the elements once the roof of a residence caved in might also have eroded a mud or plaster feature to the point where it became unrecognisable as a hearth during excavation.[25] In residences with multiple storeys, any hearth located on an upper floor would have fallen during the structural collapse of the building and become an indistinguishable part of the disintegrated matter in a room's fill.

Another possible explanation is that portable braziers were used as alternatives to hearths. This situation occurred in Crete during the first half of the second millennium BC (Metaxa Muhly 1984), but remains conjectural in the case of Cyprus, where very few artefacts have been interpreted as fire containers. High-walled 'pans' from Marki with signs of fire-exposure on their internal surfaces seem to have functioned as braziers in the EC and MC (Frankel and Webb 1996: 132); similar vessels from elsewhere have often been misidentified

[25] Exposure may be a particular problem in sites situated on slopes, such as Alambra, where the depth of soil accumulation over the remains would have varied over the centuries from three meters to almost nothing, depending on variations in rainfall (Coleman 1996: 20).

(Webb and Frankel 1999: 35), raising the possibility that braziers were more widespread during those periods than is commonly supposed.[26] Additional reasons why more braziers have not been discovered is that they may have been considered too useful or valuable to leave behind during abandonment, or were made in low-fired ceramic fabrics which crumble and tend not to be recovered fully during excavation.

The presence in a room of a fixed hearth can help identify it as a 'cooking space'. However the absence of a hearth might be circumstantial, meaning that a full 'cooking space' count may not be possible in some residences.

8.6 The possibility of multi-conjugal occupancy in Cypriot Bronze Age residences

We have seen that there is some scope for identifying room function in the 40 residences, but that we are prevented from enumerating 'actual sleeping spaces', and in many cases cannot be confident in the identification of 'cooking spaces' or of the spaces that constitute a residence's 'dwelling area'. Inevitably this will severely restrict the inferences we can draw about the composition of co-residential groups in Bronze Age Cyprus.

Nevertheless, the design of Cypriot residences holds enough information to tell us what types of co-residential group the residences were or were not capable of accommodating. If we accept the three assumptions set out in section 6.7 which allow us to generalise from the ethnographic sample to other contexts,[27] then we would expect 'conjugal rooms' to be independently located with respect to one another.[28] On this basis we can tell that some residences were capable of accommodating multi-conjugal co-residential groups, whereas others were not.

---

[26] It is interesting to note in connection with this that the bases of storage jars sometimes served as makeshift braziers during episodes of squatting in abandoned buildings of the MC and LC, suggesting a familiarity with the use of braziers in the later years of the second millennium BC. In Kalavasos, an extremely fire-blackened jar base "shaped to a circular platter-like form" was found in room *A.152*, the main *pithos* magazine of the ashlar building; it differed from the other fragmentary jars in its vicinity by lacking a hole in its base, and was confidently labelled by its excavator as a 'hearth' (South 1983: 98). Five complete jars were found around the edges of room *1* in Residence 3 at Alambra, positioned within or near their stone-built emplacements, but only the lower body of a jar (F123) was found in another emplacement (Coleman 1996: 58f.), blackened on both the interior and exterior sides (ibid. 282). Both cases can be taken to mean that squatters preferred to pick out discarded jars from buildings and reuse their bases as makeshift braziers, than to dig holes in the ground to create makeshift hearths. The reuse seems to have occurred before the walls of the buildings had collapsed, so probably within the LC.

[27] The three assumptions are: that at least some members of every co-residential group normally cluster together for sleeping purposes; that every conjugal couple normally has its own independently located 'conjugal room'; and that separate cooking spaces are only required to cater for co-residential group members who are unrelated to the head or for multiple conjugal couples.

[28] Which is to say, that one 'conjugal room' does not provide the only means of access to another.

In single-storey residences where all spaces are arranged in a linear fashion (with one leading on to the next), no more than one space could have functioned as a 'conjugal room': even without knowing the functions of rooms we could argue that such residences were not designed for multi-conjugal occupancy. Meanwhile, many other residences had more than one privately situated room which could potentially have functioned as sleeping accommodation for a conjugal couple. The design of these residences was – in theory – compatible with multi-conjugal occupancy.

In what follows, the design of the 40 residences is reviewed and many of the residences are shown to be capable of accommodating co-residential groups of complex structure. Unfortunately, in the case of residences dating to the LC we cannot go any further than this in our interpretations. On the other hand, the design of a few of the residences dating to the EC and MC is provocatively suggestive of the accommodation of multi-conjugal groups.

8.6.1 The Late Cypriot Bronze Age

Problems in the recognition of room function (section 8.4) are particularly acute in the case of the LC residences. The evidence for 'cooking spaces', for example, is scarce as very few fixed hearths have survived.[29] This may be because the LC residences experienced more than their fair share of post-abandonment disturbance or because of an increased reliance on braziers in the later period; but it is perhaps best explained by a higher incidence of multiple-storey construction during the LC. Staircases to upper storeys can be recognised with some confidence wherever stone steps survive (e.g. in Kalavasos Residence 1, Enkomi Residence 2, and Hala Sultan Tekke Residence 1), but are likely to have existed in wooden or mudbrick form which has not survived in practically all of the known residences in those sites, as well as in other LC sites (Kourion and Pyla, and possibly Maa as well). Where there were multiple storeys, 'cooking spaces' may have been located upstairs. Hence it is impossible to tell how many 'cooking spaces' there may have been per residence, but we should not rule out the possibility that some residences contained more than one.

Despite the limitations in the recognition of room function, we can at least say on the basis of their design that most residences were suited to accommodating multi-conjugal groups. All the LC residences in the sample with the exception of Maa Residence 1 and Kourion Residence 3 included two or three independently located enclosed spaces on their ground storeys, some or all of which could have functioned as 'conjugal rooms'.

[29] In fact, only three 'cooking spaces' can be identified amongst the 18 LC residences: in Kourion Residence 2, in Enkomi Residence 2, and in Maa Residence 1.

Clearly, the fact that the residences had the potential to accommodate more than one conjugal couple does not mean that they necessarily did. The evidence currently available with regards to the LC is simply inadequate for deriving co-residential group composition.

8.6.2 The Early and Middle Cypriot Bronze Age

The evidence we have with regards to the EC and MC provides a far more compelling case in favour of multi-conjugal occupancy. Fixed hearths had a higher survival rate in residences belonging to earlier phases of the Bronze Age. The distribution of hearths, together with the overall design of some residences, provide a firmer basis for the inference of co-residential group composition.

In general, residences contained just one plaster-built hearth. This was true of Marki, and possibly also Sotira and Alambra, though severe post-abandonment disturbances in those sites (and superficial excavation in one residence) preclude any certainty.[30] While these residences perhaps accommodated one-conjugal or no-conjugal groups, half a dozen residences were equipped with more than one hearth, and so may have been designed for multi-conjugal occupancy (Marki Residences 2, 3, 6, 8 and 10, and Sotira Residence 4).

Several considerations can help decide whether this was the case. Firstly, did these residences contain more than one independently located room capable of functioning as a 'conjugal room'? Secondly, might the hearths have been used for something other than primary cooking operations, so that the spaces that contained them were not 'cooking spaces' at all? Let us take each consideration in turn.

The availability of 'conjugal rooms'

It is clear that three of the residences in question (Marki Residences 10 and 3, and Sotira Residence 4) were not designed to accommodate multi-conjugal groups because they had just one independently located room capable of functioning as a 'conjugal room' (Figure 8.7).

[30] Residence 4 at Marki, Residences 2, 3 and 4 at Alambra, and Residences 1, 2, 5, 6 and 7 at Sotira lack any clearly identifiable hearths, but it is not clear whether their absence reflects the true situation during occupation. The absence of hearths may have resulted from post-abandonment processes; alternatively, at least some of the one-room buildings may not, in fact, have functioned as residences with cooking facilities, but as storage or stabling annexes for near-by residences. In the case of Residence 4 at Alambra, the features identified as hearths in rooms *9* and *10* seem to be different types of pot emplacement reused as fire-containers after abandonment rather than purpose-made hearths.

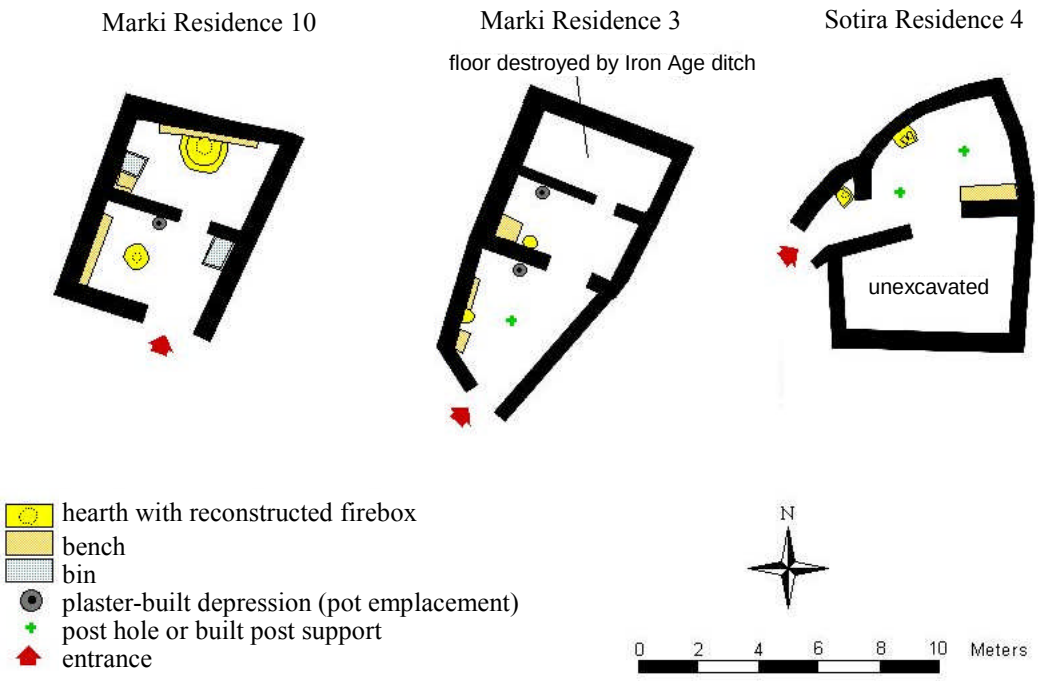


FIGURE 8.7 Residences containing more than one hearth but only one possible 'conjugal room

By contrast, the remaining three residences (Marki Residences 2, 6 and 8) contained at least two independently located spaces, each of which could potentially have functioned as a separate 'conjugal room'. Indeed, there may have been more independent rooms in each of the residences if the postholes discovered in those rooms held supports for screens or mudbrick partitions (Figure 8.8).

The identification of 'cooking spaces'

It is possible that not all hearths were used to cook meals; they may instead have been used to provide heat and lighting, to make snacks or beverages, or to heat-process dairy products or other homemade goods.

An informed guess can be made as to which hearths were used for cooking in Marki. Excavation revealed several horseshoe-shaped terracotta objects that have been interpreted as hobs. In two instances, these were found *in situ* set into a long plaster bench onto which a hearth was attached, with the arms of the object encircling the hearth's firebox (Frankel and Webb 1994; 2000: 70). The hobs were designed to hold round-based cooking pots over the fire, which otherwise could not stand up unsupported, and are therefore indicative of cooking. Although hobs were removable and have rarely been found in their positions of use, it is likely that they were always associated with the same type of hearth as in these two examples: the sort that was built up against a bench and had a low semicircular or rectangular

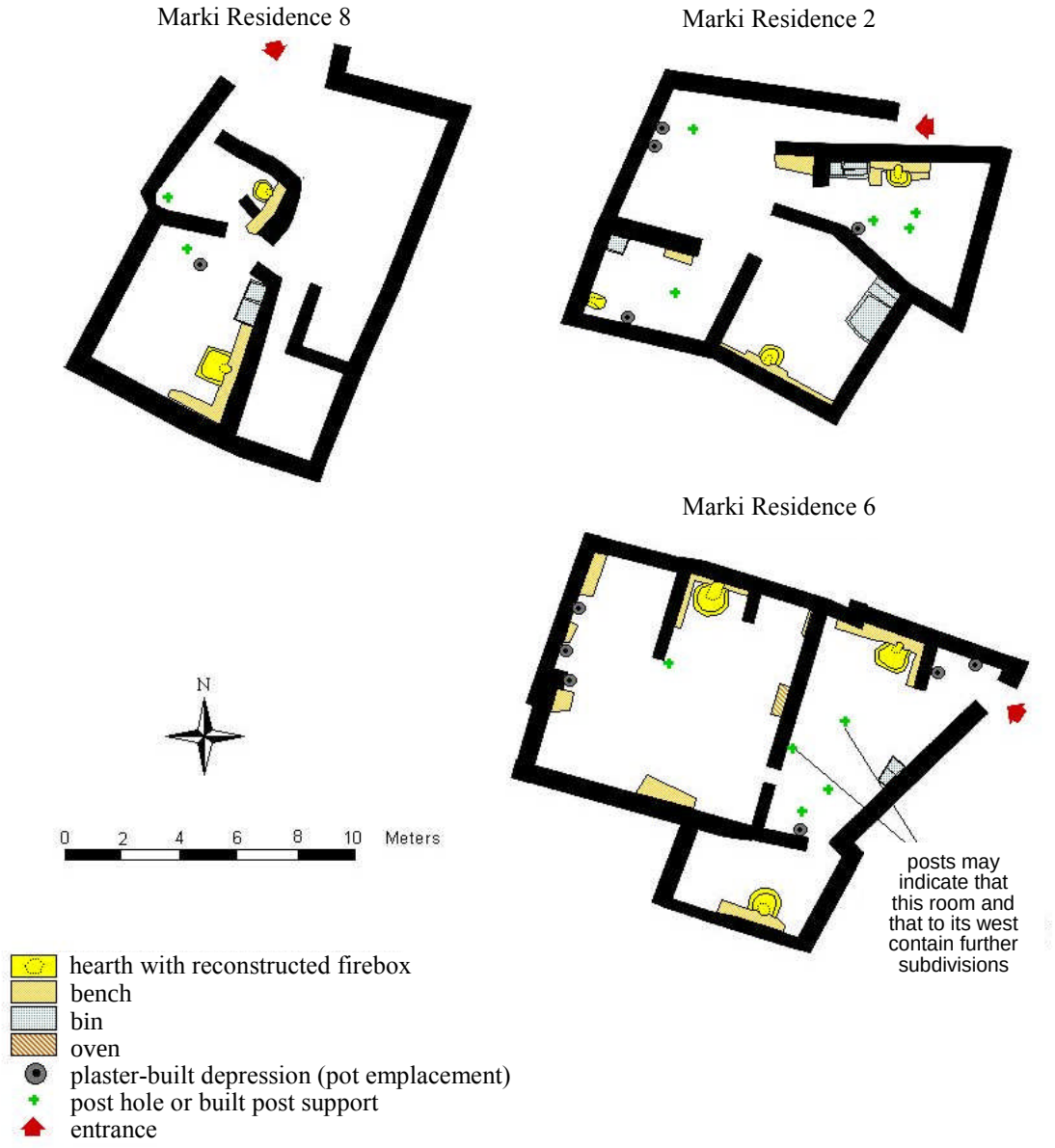
kerb of plaster or stone. Rooms that contain this type of hearth are here assumed to be 'cooking spaces'.

Thus, the northern room of Marki Residence 10 was a 'cooking space', whilst the southern room was not (Figure 8.7).[31] In Marki Residences 2, 6 and 8, all the hearths were of this type, suggesting that each residence had more than one 'cooking space' (Figure 8.8).[32] These same three residences each contained more than one possible 'conjugal room'. In light of the findings in Chapter 6, these facts taken together point to the likelihood that the three residences were designed to accommodate multi-conjugal co-residential groups.

[31] Hearths in Sotira were different in form to those at Marki, and no hobs have been discovered there. Perhaps in that region of Cyprus the distinction between hearths used for cooking and those used for other purposes lay in the number of fireboxes they contained.

[32] Although we cannot be sure whether all the hearths in each residence were functional at a single moment in time, this is likely in the case of Residence 6, since all of its rooms were built in one episode and occupied for a relatively short period of time. In Residences 2 and 8 it is possible that hearths were built consecutively to replace one another, with an older hearth becoming defunct every time a newly constructed one came into use, but there is no reason to suppose this.

FIGURE 8.8 Residences containing two or more hearths built up against benches, and more than one possible 'conjugal room'



8.6.3 Summary and questions for further research

The archaeological record of Bronze Age Cyprus is not an homogenous entity: the evidence base is built up piecemeal from a patchwork of sources whose quality is inconsistent. This becomes apparent when we probe into the question of living arrangements. Evidence from the Late Cypriot period is unquestionably poorer in quality and even more ambiguous than that from earlier periods in the Bronze Age. In part this stems from a combination of practices (e.g. brazier use), residential design choices (e.g. the construction of multiple storeys) and formation processes which complicate the inference of room function in Late Cypriot contexts. Aside from this, the evidence base relating to this period is compromised by outdated excavation and recording methods and significantly diminished by lack of

publication, which together have left many of the largest Late Cypriot sites, including Enkomi-*Ayios Iakovos*, all but unusable for the present purposes. Indeed, the evidence currently available from this period is so unhelpful that - at least for the time being - we should consider consigning the question of living arrangements to the realm of the unanswerable.

The evidence from the Early and Middle Cypriot periods is also scarce, though this owes more to low levels of interest in the relatively modest remains of the period, than to shortcomings in their excavation or publication. Despite this, the available evidence was sufficient to infer the possibility of multi-conjugal occupancy. More specifically, this inference was drawn on the basis of evidence from a single site: Marki-*Alonia*. That this site should prove to be the most informative source on living arrangements is partly due to chance. The site happened to consist of single-storey buildings of simple design with immoveable hearths, and was spared any major subsequent construction or other severe forms of disturbance; the upshot was the fairly straightforward interpretation of room function. But chance was not the only factor responsible. The site was carefully and extensively excavated using the most up to date field methods, the remains thoroughly recorded and interpreted with due consideration to formation processes, and the whole promptly published, providing archaeologists with an exceptionally sizeable and robust data source that meets modern standards of reliability. An evidence base of such high quality has the greatest potential to yield information about social organisation. In this instance, it provided clues that residences were sometimes shared by more than one conjugal couple.

This interpretation opens up a range of questions for further research. Firstly, did Marki-*Alonia* represent an isolated phenomenon, or might multi-conjugal occupation have occurred in other communities of the Early and Middle Bronze Age? If multi-conjugal co-residential groups were more widespread, did they form on an ad hoc basis, or as a matter of course through the practice of a joint residential pattern? Ongoing excavation in the near-contemporary settlements of Politiko-*Troullia* (Falconer et al. 2005; Fall et al. 2008) and Kissonerga-*Skalia* (Crewe et al. 2008; Crewe 2009), and the extension of exploration at Sotira-*Kaminoudhia* (Swiny 2008) may help shed light on these questions, provided that their excavators use excavation and publication strategies of similarly high standard to those employed in Marki.

Secondly, did multi-conjugal occupancy at Marki have antecedents in the Chalcolithic?[33] Or might this phenomenon have been introduced by Anatolian immigrants, along with other practices, at the start of the Bronze Age (see section 8.2.1)? To answer this requires that we address the same kinds of questions approached in this chapter to earlier contexts, and to sites outside the island. These are questions well worth asking at a time when mainstream scholarly opinion has reached a consensus on the migration episodes that took place in the Late Chalcolithic and attention has started to focus on the processes of hybridization, technology transfer and cultural transmission that gave rise to EC material culture. Webb has suggested that these processes may have involved "the movement of migrant or descendent migrant women into indigenous villages in a pattern of virilocal marriage alliance" (Webb 2007: 26). If in-marriage had actually taken the form of co-residence and multi-conjugal occupancy, this would have created even more compelling circumstances for the learning, adoption, and local adaption of some of the techniques and practices associated with the Early Bronze Age (for a list of these practices, see Frankel and Webb 1998: 3; Frankel 2001:21).

Looking at the other end of the Bronze Age, we might also ask whether the publication of recently excavated Late Cypriot settlements will help breathe new life into the question of Late Bronze Age living arrangements. These sites hold varying degrees of promise for adding to our existing stock of knowledge on Late Cypriot housing. The rescue excavations along the Nicosia-Limassol road at Kalavasos-*Ayios Dhimitrios*, for example, are likely to yield fewer clues about the composition of co-residential groups than the more carefully planned and extensive excavations at Hala Sultan Tekke-*Vyzaja* and Episkopi-*Phaneromeni*, while the value of Alassa-*Pano Mandilaris* will depend largely on the field methods and attention to formation processes used by its excavators. If these sites cannot deliver sufficient information regarding room function to enable us to draw inferences about living arrangements, then we will need to await the results of ongoing excavations (at Politiko-*Troullia* or Aredhiou-*Vouppes*, for example) and of future archaeological campaigns.

[33] The plan of the late Chalcolithic settlement of Kissonerga-*Mosphilia* Period 4 (Peltenburg 1998: 250, Figure 14.8) shows free-standing huts arranged in loosely defined clusters rather than architecturally-bounded complexes, suggesting that multi-conjugal occupancy was not a feature of Late Chalcolithic communities. The circular huts were apparently never bounded together to form multi-roomed residences that could accommodate more than one conjugal couple. Instead, each co-residential group occupied a single-roomed hut with a central hearth (and probably owned other dispersed architectural holdings in its vicinity). Although further study of Chalcolithic architectural remains would be necessary before any secure conclusions could be drawn, the apparent consistency in the occurrence of one 'formal sleeping space' per residence in this context may point to the operation of a nuclear residential pattern.

8.7 Conclusion

Bronze Age Cyprus gave us the opportunity to explore a number of procedural difficulties surrounding the inference of co-residential group composition from archaeological data. In particular, it emphasised the obstacles we face in identifying how rooms were used during their occupation, and the complications created by formation processes and the quality and extent of excavation and publication. These challenges are by no means exclusive to the interpretation of the Cypriot Bronze Age archaeological record but common to most prehistoric records, and even to some of the best preserved historic sites such as Pompeii and Herculaneum (section 7.4).

The Cypriot context serves not only as an illustration of problems of interpretation, but also of the interpretative potential offered by sites where high standards of excavation and publication have been used, such as in Marki-*Alonia*. In a prehistoric context such as this, we may never come across any definitive evidence of co-residential group composition or the residential pattern practised by ancient inhabitants. Even in the absence of historical evidence, however, careful excavation and attention to formation processes - along with a measure of good fortune - may reveal clues that can help us create plausible reconstructions of past living arrangements. The available evidence in Marki was sufficient to raise multi-conjugal occupancy as a distinct possibility, and to open up new research questions and fresh ideas with which to confront emerging data from ongoing and future excavations. Provided that these standards are employed elsewhere, the insights developed in Part II can be used to deduce co-residential demographics from the archaeological record.

CHAPTER 9
Conclusion

This thesis began with the hypothesis that there is some degree of 'fit' between the demographic characteristics of co-residential groups and the layouts of their residences, and set out to explore how this 'fit' comes about, what the 'fit' entails in different cultural contexts, and whether there were practical ways in which the 'fit' could be exploited (more specifically, by archaeologists for the interpretation of excavated residences).

To this end, a range of secondary sources were used. Studies by anthropologists and family historians equipped us with a basic vocabulary with which to talk about co-residential groups, and provided a basic understanding of how and why people come together to form co-residential groups. However, these sources could not tell us much about the ways in which *space* impacts on residential decisions and living arrangements. For this we needed to turn to another source of data, the ethnographic record, which allowed us to study co-residential groups alongside their residences. Case-studies drawn from the ethnographic record helped us establish that space does, indeed, influence the formation of co-residential groups and subsequent changes in their memberships, confirming the notion that a relationship or 'fit' exists between the composition of groups, on the one hand, and space, on the other. A broader, cross-cultural ethnographic data set was then used to better define this 'fit', and the insights garnered from this exercise were used to demonstrate that in some archaeological contexts it is, in fact, possible to infer co-residential group demographics.

To bring this thesis to a close, it is worthwhile briefly outlining some additional reflections that stem from this investigation. The three main objectives set at the start of the thesis provide a general structure for setting out these thoughts.

Objective 1

To explain how co-residential groups in various cultural contexts form, and how they change their composition – and especially what role space plays in this.

Existing anthropological and historical sources on the composition of co-residential groups, though now somewhat outdated, are still valuable if we want a basic grasp on why co-residential groups vary in their composition. However, living arrangements ultimately come down to the residential decisions of individuals. The case studies in Chapter 5 can leave us

with little doubt of the significance of spatial circumstances in residential decision-making, and demonstrate that we have a lot to gain from approaches that focus on how individuals reach decisions, rather than on 'contributing factors' *per se*. If we want to develop and extend our understanding, then a potentially fruitful way to do so would be through further exploration of the ethnographic record. In particular, I would propose the need for qualitative research on the views of community members regarding the residential decisions one is expected to make upon marriage, their attitudes towards the co-residence of couples, and the processes by which they reach decisions about their living arrangements. The present study suffered from the absence of this type of information.

Objective 2

To determine whether basic demographic characteristics of co-residential groups can be inferred from the spatial attributes of their residences.

Cross-cultural samples are, by their nature, limited. This should not stop us from bringing together data from different contexts and searching for regularities. As this research demonstrated, the process of searching is valuable in itself: comparison between cases, and consideration of when and why the evidence varies, can generate conceptual generalisations that are transferable even if the statistical trends we discover in the data cannot strictly-speaking be applied elsewhere. Notably, the theoretical understandings developed in Chapter 6 helped us identify some of the misapprehensions held by archaeologists with regard to the relationship that exists between co-residential group demographics and the spatial attributes of residences.

Objective 3

To establish whether the insights developed from ethnographic research are useful for deducing co-residential group demographics from the archaeological record.

Clearly, archaeological data has very specific characteristics which will significantly affect the degree to which any relationships established through the ethnographic record can actually be exploited in archaeological interpretation. Without an appreciation of the effects of abandonment and post-abandonment processes, room function may be misinterpreted, and the spatial attributes of residences misunderstood or misidentified, leading to simplistic or incorrect inferences about their occupants.

That being said, it behoves archaeologists to be resourceful, using all available historical and material evidence to gain an understanding of one of the most essential aspects of the social organisation of past societies: their living arrangements. We should take heart from the case

of Bronze Age Cyprus, where it was possible to draw inferences and build plausible hypotheses on the basis of a relatively modest prehistoric archaeological record. Recent and current excavations of Bronze age settlements in Cyprus (in Kalavasos-*Laroumena*, Politiko-*Troullia*, Kissonerga-*Skalia,* Maroni-*Tsaroukkas* and Alassa-*Pano Mandilaris*) will no doubt yield more data that in the future can help us make further advances in this area.

GLOSSARY

Actual sleeping space: an enclosed space within a residence used by residents for sleeping.

Aversion trends: a term indicating the regular avoidance of co-residence between categories of kin. Different aversion trends are associated with each of the three residential patterns.

Community: the population at a particular locale, such as a settlement, or an administrative or geographic region.

Conjugal room: a category of 'actual sleeping space' used by a married resident and their spouse, sometimes together with other people. Generally speaking, these are independently located with respect to one another, so that one 'conjugal room' does not provide the only means of access to another (a situation which would compromise the privacy of a couple).

Cooking space: an enclosed space within a residence used for primary cooking activities.

Co-residential group head: the resident under whose name the property is held.

Co-residential group size: a demographic term indicating the total population of a co-residential group. This is measured by counting every person who regularly sleeps in a given residence overnight, and anyone who has regular access (e.g. on a seasonal or periodic basis) to sleeping accommodation in that residence.

Co-residential group structure: a demographic term indicating how far the membership of a co-residential group deviates from the benchmark of 'an adult couple and their children'. This is measured by a count of the conjugal bonds which exist amongst the group's members.

Culinary unit: a group of people who regularly co-operate in domestic cooking activities.

Dwelling area*:* a measure combining the floor areas of all enclosed spaces in a residence that are used by the residents for their everyday living. It excludes any spaces used primarily for storage, economic activities, formal occasions, or to assist in circulation, as well as all unenclosed spaces.

Formal sleeping space: an enclosed space in a residence designed as sleeping accommodation for either residents or guests, but which may or may not be in use for this purpose in any given period.

Functional replication: the existence of spaces within a residence that replicate each other's function, e.g. multiple bathrooms, living rooms, or kitchens.

Ground-plan area: a measure of the area on the ground floor that lies within the boundaries of a residence.

Natal co-residential group: the co-residential group a person is born into.

Nuclear family: an adult couple together with their children.

Nuclear hardship: the difficult circumstances encountered by individuals who live independently, following illness, the death of a spouse, or economic misfortune (Laslett 1988). One way of mitigating against nuclear hardship is to offer someone in difficulty space in one's residence, and therefore membership of one's co-residential group, normally on a temporary basis.

Residence: this consists of an enclosed space dedicated to sleeping and any spaces which directly or indirectly communicate with it, up to but excluding any 'public' transitional spaces.

Residential decisions: actions and strategies which directly affect the membership of a person's co-residential group. Examples include: the decision to remain in one's natal group upon marriage or to leave and join other groups; the decision to offer accommodation in one's residence to an acquaintance experiencing 'nuclear hardship'; the decision to retain sons while expelling daughters from the parental residence when they reach adulthood.

Residential pattern: a demographic term which combines and distils three related concepts from anthropology and family history ('post-marital residence rules', the 'developmental cycle' and the 'limit of growth'), all of which have to do with the occurrence of regularities in the residential decisions of people belonging to the same community. The three forms of the pattern – nuclear, stem, and joint – denote the maintenance by some people but not others of life-long membership in their natal co-residential group.

Co-residential group composition and the spatial design of residences: an investigation using the ethnographic and archaeological records

Eleni Theodora Romanou

Thesis submitted for the Degree of Doctor of Philosophy, UCL (University College London)

I, Eleni Theodora Romanou, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

VOLUME 2

APPENDICES AND BIBLIOGRAPHY

TABLE OF CONTENTS

LIST OF FIGURES

APPENDIX A
Descriptions of the fourteen communities in the sample

This appendix offers background information regarding the 14 communities in the sample. The information on each community is divided into three sections:

a) The *description of the settlement* covers the settlement's location (also shown in Figure 4.1), size, amenities, and regional importance.

b) The *description of the inhabitants* presents a picture of the community's economic complexity, and demographic, ethnic, linguistic and religious composition.

c) The *description of the community's domestic architecture* outlines the form of a 'typical' residence, and provides information about the construction, design, and durability of residences.

Aliabad

Data pertaining to this pseudonymous community is derived from the publication of an ethnoarchaeological study conducted by Kramer in the summer of 1975 (Kramer 1982).

a) The community, situated in a valley of the Zagros Mountains in the Hamadan province of central western Iran, was established at least one hundred years ago (ibid. 143). Its residences extend over approximately 3ha (ibid. 17) and are occupied year-round. Aliabad lacks electricity, piped water and paved roads, but is equipped with a government school and communal bathhouse. Although Aliabad's inhabitants fall under the political jurisdiction of the town of Tuyserkan (locally) and the city of Hamadan (provincially), the Kurdish urban centres of Kangavar and Kermanshah are the population's preferred sources of goods and services (ibid. 154), while the Iranian capital Tehran is the most popular destination for seasonal migrants (ibid. 61). Marriage alliances tend to be more localised, taking place between inhabitants of villages of similar size that are located within walking distance of the community (ibid. 195).

b) Aliabad is inhabited by 418 people, all of whom are Shi'a Muslims who speak Kurdish and have a sense of Kurdish identity (ibid. 21). The population is broadly homogeneous also in economic terms, with almost all co-residential groups having members engaged to some degree in stockbreeding and agricultural activities, the latter consisting primarily of wheat and barley cultivation on both dry-farmed and irrigated land, and supplemented by the planting of legumes, vegetables, animal fodder and several types of fruit (ibid. 27f.). Co-residents tend to pool their resources (ibid. 21) and together produce much of the food they need with little saleable surplus (ibid. 27). Additional income in cash or in kind may be derived from the seasonal migrant labour of adult and adolescent male members of the co-residential group, by renting out land parcels, motor vehicles, or labour, or by exchanging small amounts of imported or home-made wares (ibid. 61). Land, agricultural implements and livestock are not equally distributed amongst Aliabadi co-residential groups, however: about half are land-less and 17 do not own any sheep or goats (ibid. 26, 67). Land-less groups put their productive members to work as farm labourers or seasonal town labourers (ibid. 61), while those who lack workers rely on welfare from their relatives (ibid. 61).

c) A typical residence consists of one or more flat-roofed rectilinear living rooms, kitchens, storerooms and animal shelters, arranged in a nucleated manner around the edges of an unroofed courtyard, and sometimes distributed over two storeys; a high wall seals any gaps between the rooms, creating a distinct enclosure (see Figure 4.2 for the plan of A1001). The rooms are made of local materials: sun-dried mudbrick and packed mud for walls, earth and

wood for the flat roofs, and occasionally stone for the foundations of walls (ibid. 92f.). The labour for the construction process is also local, usually involving the efforts of the residents themselves, and is executed seasonally over a number of years by the gradual accretion of rooms within the courtyard wall, and eventually the addition of upper storey rooms (ibid. 94). There are no formal planning regulations or permits that may constrain construction or the size and form of residences. Co-residential group heads can build residences on plots within the community area (which may be inherited, purchased or exchanged), but can also buy them ready-made, acquire them through the system of inheritance operating amongst agnatic males, or receive them as gifts (ibid. 145f.). Individual residences can survive for over 50 years (ibid. 143), during which time they may be subdivided (ibid. 145) and room functions can be changed (ibid. 97). Upon abandonment, their roof beams are often removed and reused, thus hastening the disintegration of the superstructure (ibid. 94).

Baghestan

Ethnographic records of the domestic architecture and inhabitants of Baghestan were made in the summer of 1976, and published as part of an ethnoarchaeological regional study (Horne 1994).

a) With an area of 1.89ha, Baghestan is one of the largest settlements in the Tauran plain in the Semnan province of north-east Iran (ibid. 59) and is occupied year-round by the majority of its residents (ibid. 79). Baghestan lacks piped water and electricity (ibid. 7), but is equipped with a government-sponsored schoolhouse and a communal religious centre. The inhabitants fall under the administrative jurisdiction of the town of Shahrud (ibid. 4) and obtain products or services from the nearest town of Sabzevar (ibid. 37). Localised interaction with the inhabitants of neighbouring villages on the plain is frequent (ibid. 73).

b) All of the 154 residents of the community are ethno-linguistically Persian (ibid. 3) and Shi'a Muslims. Almost every adult is dependent on a combination of agriculture and pastoralism for their livelihood. Most own small landholdings – either rain-fed or irrigated from the communal *qanat* channels – where wheat, barley, melons, onions, tomatoes and grapes are cultivated for their co-residential group's consumption needs (ibid. 4). Milk and meat are procured from their privately owned sheep and goats, which graze in pooled flocks on the village common pasture and spend at least part of the year at sheep stations (ibid. 42). Co-residential groups which rely primarily on pastoralism may relocate to summer milking stations between May and August, but then return to their residences in Baghestan, either bringing their flocks with them or sending them on to winter stations with shepherds (ibid. 64). Co-residential groups that lack the resources to practise mixed farming may hire out

members as shepherds or day labourers; a small number have no option but to depend on local charity (ibid. 152). Some inhabitants have supplementary incomes in cash or in kind from part-time specialisations: these include the shopkeeper/butcher, miller, and four builders (ibid. 90, 132). Inhabitants of the Tauran plain also have the option to farm cash-crops, work locally as part-time craft specialists, migrate seasonally to cities to work as unskilled labourers, or pursue full-time occupations as government employees (ibid. 40, 38, 36), but Horne does not indicate how many Baghestani residents have taken advantage of these opportunities.

c) A typical residence in Baghestan consists of a single rectilinear living room and one or more storerooms; each room has a domed roof and opens directly onto a forecourt bounded by a low wall (see Figure 4.2 for the plan of B1032). Additional rooms used for storing goods and sheltering animals often lie beyond the limits of the residence (ibid. 166). Residences are privately owned and individual rooms are alienable: they may be inherited by men or women in accordance with the local pattern of bilateral partible inheritance, or alternatively may be bought, or constructed by the co-residential group on building plots available for purchase at low prices in and around the built-up area (ibid. 147). Construction is seasonal and usually proceeds on a room-by-room basis over a number of years, starting with the living room and ending with the courtyard wall (ibid. 148). Each room is normally built of local materials, mainly earth from the vicinity of the building site which, together with straw and dung, is used to create the mudbricks for the walls and the domed or vaulted roofs of individual rooms (ibid. 129ff.). There is an increasing tendency for windows and doors to be purchased in the city by those who can afford them (ibid. 90). The owners of a residence are ordinarily also its designers and builders, but local semi-skilled helpers and specialists from other villages or the city may also occasionally be hired for construction jobs (ibid. 132). Residences are laid out according to local notions of appropriateness (ibid. 148) and the desire of some residents to emulate certain urban characteristics (ibid. 119), rather than in accordance with any formal planning regulations. With regular maintenance, rooms can stand for more than 50 years (ibid. 180), though most last for 20 or 30 years (ibid. 185). During that time their functions may change (ibid. 179), and they may be passed on through sale or inheritance; eventually they are left to decay without any deliberate dismantling (ibid. 170).

Capileira

The ethnographic investigation of the domestic architecture and inhabitants of this community was undertaken in 1981 in conjunction with the study of historical texts and oral accounts concerning architectural modifications, to explore the cultural origins of local types of housing (Delaigue 1988; Allart and Delaigue 1984).

a) Situated in the Alpujarra Alta – the southern foothills of the Sierra Nevada – in the south of Spain, the 5ha settlement (ibid. 25) is accessible by a tarmac road (ibid. 21), supplied with electricity (ibid. 23) and piped water (ibid. 37), and equipped with a town hall, school, post-office, bank and museum (ibid. 36ff.). Capileira's inhabitants fall under the administrative jurisdiction of Orgiva (ibid. 36), located 20km away, and of the provincial capital Grenada, from which they can buy goods and obtain medical services (ibid. 43). Capileira itself is administratively responsible for the hamlet of Cébadillas (ibid. 23). The settlement is occupied year-round by most of its inhabitants, and is known to have existed by this name since at least the late 15th century (ibid. 253).

b) Of the 665 permanent residents (ibid. 42), the vast majority are native Andalucians of Castilian ethnicity, and minorities consist of gypsy Gitanos and immigrants from other parts of Spain (ibid. 44f.); all practise Catholicism (ibid. 46f.). As a consequence of the high rate of permanent emigration by younger people to larger centres in search of work and higher education (a demographic phenomenon which began in the 1950s), the mean age of the resident population is high, with almost half the co-residential group heads subsisting on old-age pensions (ibid. 42f.). Most of the remaining adults work in commerce and services or as government officials; a smaller proportion is primarily dependent on agriculture; and a yet smaller number rely on pastoralism (ibid. 42, Figure 3). Many of those in the latter two categories supplement their incomes with occasional work in the local tertiary sector (ibid. 113).

c) A typical residence is rectilinear and has two or more storeys: stables, storerooms or spaces used for commercial purposes are located on the lower floor, and bedrooms, a kitchen, and a bathroom (sometimes accompanied by a living room and dining room) are located above. The terrain on which Capileira is built slopes at a twenty degree angle (ibid. 25), and many residences are cut into the slope at both their lower and upper storeys; the different storeys may be accessed via internal staircases as well as, in some cases, from a separate entrance at each level that opens to the exterior (see Figure 4.2 for the plan of C1056). Thirty of the 386 residences in Capileira are of relatively recent construction (ibid. 65), built by professional local builders (ibid. 72) using modern imported materials such as cement and metal girders. The rest are older multiple-storey stone structures with wooden-beamed ceilings and flat, earthen roofs, originally made of locally available materials but renovated in recent years with imported components (ibid. 66ff.). Residence layouts are often irregular, and follow local design conventions (ibid. 65) rather than formal planning regulations. Individual storeys in a single residence may have different floor-areas: upper storeys may have more available space than below if the slope of the building site allows this, or if floor space is added over an

adjacent roadway to create a suspended extension, or if walls are knocked through to the upper-storey rooms of a neighbouring residence (ibid. 81). Residences are privately owned and are sometimes subdivided; the parts or whole may be rented out, sold, exchanged with a family member, or passed on to a child or grandchild after the owner's death (ibid. 103, 115ff.), extending the use-life of some of the rooms to perhaps a century or more. If a residence becomes unoccupied, part of it may be bought by a neighbouring co-residential group wanting to expand their own residence (ibid. 117); alternatively, rooms may be bought or rented by inhabitants of the community who reside further away but require storage space, or the entire residence may be sold to a non-inhabitant of Capileira as a holiday house (ibid. 118).

Denpasar

The residences presented here are derived from the records made by Lancret in 1992 as part of an ethno-architectural analysis investigating foreign and modernising influences on Balinese vernacular housing and traditional residential patterns (Lancret 1997).

a) Situated in the Badung province in the southern part of the Indonesian island of Bali, and with an area of 12,400ha (ibid. 96), the settlement forms the largest urban nucleus on the island and is its administrative and economic capital. Denpasar has a history as a royal capital in the late 18th century (ibid. 82), having been formally established as a Dutch colonial centre in 1906 (ibid. 87). It is equipped with all modern public utilities and services, communication and transport links, government administrative buildings and higher learning institutions.

b) Eighty percent of the estimated 350,000 residents (ibid. 93) are ethno-linguistically Balinese, but there is also a substantial Javanese population, and smaller Chinese, other Indonesian, Arab, and Punjab minorities (ibid. 98ff.). Whilst the vast majority practise Hinduism (without strict adherence to the caste system), a significant proportion is Muslim, and smaller sections of the population are Catholic, Buddhist, or non-Catholic Christian (ibid. 100). The local economy is mostly geared to the needs of the nearby tourist resorts of Sanur, Kuta and Nusa Dur, with many residents commuting there on a daily basis or involved in small-scale industries producing handicrafts and souvenirs. Denpasar's tertiary sector, hotel and tourist industry, and textile and garment industry, attract investors, managers, government officials and labourers, and are responsible for the very high rate of population growth in the community over recent decades.

c) Most traditional residences constructed in the first half of the 20th century have been renovated. They are constructed of brick (ibid. 59) and consist of a perimeter wall enclosing several pitched-roofed rectilinear buildings that are arranged around one or more courtyards

(see Figure 4.2 for the plan of D1014). Each residence includes a family temple, several multifunctional pavilions (some enclosed, others lacking a wall on at least one side), and a variable number of multi-roomed structures containing bedrooms, a kitchen, and sometimes a living room, a veranda, a storeroom or a toilet. Customary materials such as the straw or palm-leaf used for the roofs of pavilions continue to be in regular use, but the wooden posts that traditionally hold up pavilion roofs are now often replaced by concrete pillars (ibid. 57), and most buildings have concrete frames. Skilled building contractors and labourers may be hired to carry out any extensions and renovations to old-style residences, while modern residences are designed by privately commissioned professional architects (ibid. 240). Modern residences are usually erected on purchased plots, and their construction may take a number of years (ibid. 172, Footnote 31); instead of a range of free-standing buildings and pavilions, they are laid out as a ring of interconnected rooms surrounding a small courtyard, with the family temple normally situated on an upper storey. Both old and new construction makes reference to local cosmological rules of design (ibid. 32ff.); since the 1960s, planning regulations issued by the government and aimed at improving sanitation, preventing fires, and presenting a 'vernacular' Balinese image to tourists have also affected aspects of residence design (ibid. 124, 222, 227). Older residences in Depansar may be bought, new ones may be commissioned, and spare rooms may be rented out to relatives or strangers (ibid. 154). Privately owned residences may also be substantially extended over time to accommodate adult children and their nuclear families (ibid. 159ff.).

Hasanabad

Data regarding this pseudonymous community and its inhabitants is derived from Watson's monograph on her ethnoarchaeological fieldwork, carried out in the first six months of the year 1960 (Watson 1979).

a) The settlement extends over approximately 1.5ha (ibid. 35, Figure 2.1), and is situated in the Zagros Mountains in the Kermanshah administrative province of western Iran. It is thought to have been occupied for at least five generations (ibid. 21). Hasanabad lacks electricity and piped water, and its only non-residential buildings consist of a small gendarme barracks building, and the *Q'ala*, which functions as a part-time residence for absentee landlords and a centralised storage facility (ibid. 40). In terms of political administration, Hasanabad's inhabitants fall under the jurisdiction of the provincial capital Kermanshah, from which they obtain governmental and health services, gain waged employment, purchase goods, and sell any of their agricultural surplus (ibid. 31). Hasanabad acts as the base for all policing activity in the area (ibid. 217), but is dependent on a small nearby settlement for school facilities (ibid. 27).

b) The residents of Hasanabad in early 1960 numbered 207 people, including the gendarmes who were temporarily based at the barracks, or who rented spare rooms in occupied residences (ibid. 46). Twenty-one of the 194 permanent inhabitants of the community emigrated during Watson's fieldwork, mostly to nearby communities of similar scale (ibid. 228): the recent high rate of emigration of entire co-residential groups was the consequence of four years of economic crisis (ibid. 9), which left behind a diminished but demographically balanced population. Hasanabadis are Kurdish-speaking and refer to themselves as Kurds (ibid. 24). They exhibit some generalised Islamic beliefs and practices without strict adherence to prayer and periods of fasting or observance of religious holidays (ibid. 232). Apart from the gendarmes, nearly all residents depend on a combination of stockbreeding and agriculture for their livelihoods. They raise sheep and goats for their milk products and eventually for sale (ibid. 70), and cultivate wheat, barley, legumes, maize, tomatoes and melons for the consumption of the co-residential group to which they belong, as well as fodder for their animals, and poplar and willow to be sold to lumberyards in Kermanshah (ibid. 66). Individuals do not own the land on which they work, but instead are granted plots and water for irrigation by one of five absentee landlords in return for one third of their harvest (ibid. 48). Some people earn an additional income from the seasonal production and trade of baskets and rugs (ibid. 174ff.); one man makes an income from trading city-bought goods in his small store (ibid. 28); another is a building specialist (ibid. 121); and another a cow-herder who hires his services to the community (ibid. 228). In addition, several young men were engaged in military service during Kramer's fieldwork (ibid. 211).

c) A typical residence consists of one or more flat-roofed rectilinear living rooms, storerooms and stables, arranged in a nucleated manner on one side or around several sides of a courtyard; the yard is usually delimited by a high wall whose gate opens onto the street (see Figure 4.3 for the plan of H1008). Rooms are constructed of local materials: walls consist of courses of sun-dried mud dug from the vicinity of the community and tempered with straw; roofs are made of mud and locally grown poplar beams, willow twigs, and reeds; and lime for whitewashing can also be acquired nearby, though it may instead be bought at Kermanshah (ibid. 119f.). Construction is a seasonal activity (ibid. 119). Residents are responsible for the improvement and structural upkeep of their residences (ibid. 229), and may hire a specialist from the local community to carry out building and remodelling projects (ibid. 121), although some of the labour is normally provided by male members of the co-residential group (ibid. 298). No mention is made by Watson of planning regulations that may constrain the size or form of residences. Once built, a properly maintained residence can survive for at least 50 years (ibid. 161). During this time, it may be subdivided, upper storey rooms may be added, and the functions of rooms may be altered. There is no evidence that absentee landlords have

the power to shift or dispossess sharecroppers from their domiciles. Residences appear to be the private property of their occupants, and can presumably be sold or exchanged during their owner's lifetime and passed down to male heirs after death, as is the case with moveable property (ibid. 213). When rooms are abandoned they are left to collapse, a process which is hastened by the salvaging of beams for resale (ibid. 230).

Ibadan

Social and architectural data from Ibadan was collected in the years 1967-9 as part of a comparative multidisciplinary study aimed at describing and analysing the relationship between traditional urban houses and their inhabitants in three developing African cities (Schwerdtfeger 1982).

a) Situated in south-western Nigeria, the 10,000 ha settlement formed the second largest urban nucleus in the country at the time the study was carried out, and was the political and administrative centre of the semiautonomous Western Region. Ibadan's history stretches back to the early 19th century, when it was established as an army camp (ibid. xxxv). The settlement is equipped with roads and a railway (ibid. 105), governmental buildings, a hospital and commercial area (ibid. 370), an airport and a university (ibid. 118), as well as electricity and piped water (ibid. 170).

b) Ibadan's estimated population is around one million (ibid. xxxv); however, this count is uncertain as it includes seasonal immigrants from the rural hinterland engaged in casual jobs, but may exclude people who consider themselves permanent residents but periodically travel out to their fields (ibid. 116). The high rate of immigration that began under colonial rule (ibid. 105) created a 7% population increase per annum over the past twenty years (ibid. 278); moreover, immigration was age-selective, attracting mostly male and female workers aged 20-29 (ibid. 120), who now constitute the majority of the population. In terms of its ethnic composition the community is fairly homogenous, with approximately 95% Yoruba residents and only small minorities from other Nigerian tribes (ibid. 119). There is greater heterogeneity in religion, with an estimated 60% Muslim population, 32% Christian, and 8% Animist (ibid. 107). Many residents derive their wealth and livelihood from the cultivation of cash-crops, either by farming full-time or sharing the proceeds from a farm run by their relatives. The main crops are cocoa and oil-palm, which are exported, but also kola, yams, maize, cassava, rice, oranges, bananas and various vegetables grown for the home market (ibid. 101). Small-scale craft production, including tailoring, carpentry, dyeing and mechanical industries, also play a significant role in the community's economy (ibid. xxxv),

as does retail trading, which is carried out by a substantial proportion of the female population (ibid. 156), and employment in the tertiary sector (ibid. 155).

c) The most common type of residence within the old settlement walls is of semi-traditional form (see Figure 4.3 for a plan of I1042), and consists of a single-storey rectilinear building with a pitched roof containing a double row of living rooms, each opening onto an enclosed central hall or corridor; the latter often leads onto an unroofed back yard containing a communal kitchen, bathroom, pit-latrine and one or more storerooms (ibid. 125). Typically, the walls of such residences are made of courses of packed mud or mudbrick, sometimes rendered in cement; since the beginning of the 20th century roofs have been made of timber or bamboo covered with sheets of corrugated iron (ibid. 161ff.), the only major non-local material in use. Construction tends to be a gradual process carried out seasonally, and the residence takes a period of three years on average to take its final shape, during which time funds for the project are gradually accumulated (ibid. 162). Building is carried out by specialist bricklayers assisted by unskilled helpers, and professional carpenters (ibid. 166f.). Schwerdtfeger makes no mention of any planning regulations that must be followed in completing the design. If a new residence is constructed on a purchased plot, it is considered private property and can be passed on to the owner's heirs (ibid. 111). Each older residence, on the other hand, is held communally by a corporate group of relatives who may or may not reside there (ibid. 110); the property is allocated to members of the group who have usufructory rights over it but cannot alienate it without the approval of every group member (ibid. 286). Residences may also be rented out (ibid. 372), and individual rooms sublet (ibid. 112). Once a residence has been built, it will stand for an average of 25 years (ibid. 168), while those with corrugated iron roofs can survive for over 50 years. During this time, a residence may be sub-divided (ibid. 146); rooms may be reallocated if their occupants die or emigrate (ibid. 313); and new rooms may be added to accommodate additional relatives or with the view to renting them out. Construction of entirely new residences, however, is restricted by the lack of available building plots within the walled part of the settlement (ibid. 169). As a consequence, most new residential construction occurs in the suburbs and is of the modern style: designed by architects, made of concrete, and supplied with water, a sewage system and electricity (ibid. 125).

Kireyka

Social and architectural information about this community is derived from an ethnoarchaeological study describing the inhabitants' economic and social activities, and investigating their spatial patterning on both the regional and intra-community scales (Tobert 1988).

a) Kireyka is situated on the Umm Delu plain, within the Kebkebiya District of Northern Darfur in Sudan. It was established as a permanent settlement in 1968 by people fleeing the drought in Dar Zaghawa (ibid. 97), and is occupied on a seasonal basis by a group of inhabitants who return to it at the start of each rainy season (ibid. 34). Its standing buildings extend over an area of approximately 3.5ha (ibid. 107, Figure 16), and, apart from a defunct mosque (ibid. 105), include no communal buildings; the community also lacks running water (ibid. 56) and all modern utilities. In terms of political administration, its residents fall under the jurisdiction of Kebkebiya (ibid. 5), which is equipped with government offices, small hospitals, junior schools, shops for groceries and clothes (ibid. 70), and a twice-weekly market (ibid. 31). Inhabitants can obtain goods and services both there and in El Fasher, the primary regional centre and capital of Northern Darfur (ibid. 70). Staples, luxuries and fresh meat can also be purchased from the once-weekly local markets at closer tertiary centres such as Umm La'ota and Girgo (ibid. 47). Inhabitants regularly engage in friendly interaction, visiting, and co-operation with relatives and co-spouses based in small nearby communities (ibid. 37, 206).

b) Kireyka has 133 residents (ibid. 110), including 11 men who reside there on a part-time basis (ibid. 41). As a result of a drought and recurring poor harvests since 1982, numerous co-residential groups abandoned the community prior to the study in search of better economic opportunities (ibid. 121); since this permanent mass emigration was not age- or gender-specific, the remaining population did not suffer from a demographic imbalance. All the residents are ethnolinguistically Zaghawa, and all but one belong to the lowest of the three Zaghawa classes, the 'Blacksmith' group (ibid. 32). The exception is a woman belonging to the highest class, the 'Sultans', who was ostracised by her peers (ibid. 110). All the residents observe some Muslim proscriptions (ibid. 157) and follow the teachings of Koranic doctors in Islamic religious practices (ibid. 52), but they are also superstitious and do not believe in life after death (ibid. 152). Every adult resident relies on agriculture as a primary economic pursuit, combined with stockbreeding and craftsmanship (ibid. 34f.). During the rainy reason, they cultivate crops and vegetables for their own consumption on nearby rain-fed fields. Women have usufructory rights over this land, granted to them by an absentee non-Zaghawa landlord (ibid. 99). The main crops grown are bullrush millet, sorghum, watermelon, beans, sorrel, okra and cucumber (ibid. 37). Cattle, goats and sheep are raised for their milk products, for sale, and for paying bride-price (ibid. 39), and herds are considered a person's main economic asset (ibid. 33). During the dry season, most adults disperse from the community. Men travel individually to market centres up to 200km away (ibid. 18), to peddle metal or leather wares which they produce either in Kireyka or on work sites set up on the outskirts of the market centres (ibid. 41ff.). Women, meanwhile, take their

young children to market centres throughout Darfur province, setting up successive camps with female relatives in order to manufacture and sell pottery (ibid. 46ff.). Older men and teenagers remain in Kireyka during the dry season to take charge of their relatives' animals, which they herd in the immediate vicinity of the community (ibid. 39), while leather tanners also stay behind and sell their wares in weekly local markets at nearby centres (ibid. 44). Apart from the woman of 'Sultan' status, all women are part-time specialist potters (ibid. 56), each working as an independent economic unit (ibid. 47). Besides their various crafting activities, men earn cash be engaging in small-scale trade (ibid. 41) or by carrying out paid agricultural labour for people living in neighbouring communities (ibid. 36). Koranic doctors earn cash by writing protective charms or fortune-telling (ibid. 52); one man works as both a butcher and a tailor; and one woman earns an additional income by grinding grain (ibid. 52).

c) A typical residence consists of a circular compound wall containing one or more circular huts with conical roofs set on wooden posts; it also contains a number of unroofed spaces bounded by reed screens and used for washing, tethering animals, planting and craft-working (see Figure 4.3 for the plan of K1046). The walls of huts have stone foundations and are usually made of locally-quarried mud (ibid. 99), or a combination of mud and stones, or of straw obtained from the residents' fields and bound with fibre from local *hajlid* trees; roofs are of wood procured from the surrounding foothills; the walls that delimit the compounds are of straw, logs or wooden stakes, and may have a fence of thorn bushes placed around their perimeter (ibid. 132). In some cases, an 80cm-tall thorn fence with one or more entrances may enclose several compounds, and the conglomeration is considered as a residence in its own right (ibid. 125). Each new residence is constructed by the female occupant's mother at the time of the residents' betrothal (ibid. 149) on freely-available common land within the territory of the community (ibid. 99). Later building activities aimed at enlarging, renovating or maintaining the residence are the responsibility of the head (ibid. 198) and are carried out seasonally (ibid. 129): the head builds any necessary walls (ibid. 104) while her husband constructs the roof with assistance from other men (ibid. 132). No formal planning regulations affect the residence design, form or size, although local customary concerns over privacy play a role. Each residence is privately owned (ibid. 104), and is normally abandoned after the death of an occupant (ibid. 121) or sold if the head emigrates (ibid. 121). Property rights are not retained indefinitely after abandonment: neighbours may reoccupy a residence (ibid. 240), convert it into an animal corral (ibid. 167), or even appropriate it and rent out one of its huts as a storeroom (ibid. 187). Well-maintained huts can last for ten to 20 years (ibid. 133), with straw components needing replacement every two years or so (ibid. 132). Once abandoned, decay can be a fast process, hastened by the scavenging of building materials by neighbours for the construction of new huts or kilns (ibid. 134).

Marrakech

Social and architectural data from Marrakech was collected in the years 1967-9 as part of a comparative multidisciplinary study aimed at describing and analysing the relationship between traditional urban houses and their inhabitants in three developing African cities (Schwerdtfeger 1982).

a) The settlement is situated in the western foothills of the High Atlas Mountains of Morocco and has a very long history: it was founded as an army camp by Berber tribesmen in the late 11th century but soon became a permanent settlement, and functioned as the capital of the Moroccan empire for three centuries (ibid. xxxv); under French occupation in the early 20th century, the settlement was expanded beyond its ancient walls (ibid. 191). At the time of Schwerdtfeger's study Marrakech was the regional capital of southern Morocco, the third largest urban nucleus in the country and a centre of administration, small-scale industry and tourism (ibid. 205). The walled settlement is 632ha in area (ibid. 200) and equipped with a modern economic infrastructure, including educational, sports and medical facilities, administrative buildings, shops, hotels, cinemas, and modern public utilities such as electricity and piped water.

b) The population of Marrakech numbers above 300,000 (ibid. xxxv), two thirds of whom resid within the ancient walls (ibid. 210). The rate of population growth (2.9% per annum – ibid. 278) reflects a low level of immigration, a result of severely restricted employment opportunities (ibid. 211) which has also motivated many able-bodied men to leave Marrakech in search of work (ibid. 280). Partly because age-selective immigration does not operate very strongly (ibid. 212), and partly because of improved health services that have decreased the rate of mortality in infants and the elderly (ibid. 212, 280), the demographic constitution of the community does not suffer from any severe bias, though the number of women – who tend to enter the community as wives or prostitutes (ibid. 280) – slightly exceeds the number of men. The inhabitants are predominantly Arab-speaking Berbers (ibid. 210) of Muslim faith (ibid. 277), with small minorities of Jews and Christians. There is a high level of unemployment and underemployment in the community (ibid. 254). Those in work are mainly engaged in craft activities, services, local administration, and trade (ibid. xxxv). Five percent of the labour force is employed by a food processing plant, the only modern industry in the community (ibid. 211).

c) A typical residence consists of a rectilinear, flat-roofed, two-storey building with one or two internal staircases; it contains several bedrooms, kitchens, storerooms, and sometimes a reception room, arranged in a nucleated manner around a central paved courtyard or garden

(see Figure 4.3 for the plan of M1062). Construction materials are all of Moroccan manufacture and locally available: the wall foundations are of stone; their superstructures are made of rammed earth or burned bricks laid in lime mortar; and roofs are made of timber beams covered with bamboo, mud and lime mortar (ibid. 258f.). Residence owners supply these materials and commission locally-trained craftsmen and unskilled builders to carry out extensions, improvements and maintenance work on existing residences (ibid. 258, 264), sometimes with the assistance of their own relatives (ibid. 265). Islamic principles regarding the seclusion of women appear to have relatively little influence on the layout of either old or recently-constructed residences (ibid. 293), and Schwerdtfeger makes no mention of formal planning regulations that might constrain new building works. New construction is in any case rare within the walled part of the community because of the scarcity of building plots (ibid. 282), and most construction work is instead limited to the addition of vertical extensions to any older buildings that can structurally support them (ibid. 199). A large proportion of residences is known to have survived for more than 100 years, and many are treated as capital investments by their owners (ibid. 242). Residences can be extended in order to accommodate additional relatives or with the specific purpose of renting out rooms (ibid. 282), or they may be passed on to heirs who can subdivide them, sell them, or rent them out (ibid. 198f.).

Anegondi

The housing, material culture and public architecture of Anegondi became the subject of a multidisciplinary study carried out by Tobert between 1987 and 1993. This brought together ethnographic, architectural and archaeological information in order to explore how inhabitants use and understand the spaces in their community (Tobert 2000).

a) The 100ha settlement (ibid. 1) is situated by the banks of the Tungabhadra river in the state of Karnataka in southern India, and can be accessed either by road from the nearby towns of Gangavati and Hospet, or by the river (ibid.). It is occupied year-round and has a long history stretching back before Vijayanagara times (in the 12th and 13th centuries) when, as the local seat of power, it used to be fortified and much more extensive than at present (ibid.). Anegondi has a single tarmac road and a market with several dozen stalls and teashops (ibid.), as well as various public buildings and services, which include government offices, a high school, middle school, bank, post office, several temples, a mosque and Catholic church, and community centres for different social groups (ibid. 9). Only some residences have piped water (ibid. 12) and the electricity supply is uneven and prone to failing (ibid. 144). Anegondi's inhabitants fall under the jurisdiction of Bangalore, the political and economic capital of the state, but the community also has its own decentralised council that administers

to 19 small-scale communities in the district (ibid. 5, 9). The community informally acknowledges a system of kingship that has its roots in the 7th century AD (ibid. 192) but which is not recognised by the present political system (ibid. 27).

b) Approximately 4,000 people reside in Anegondi (ibid. 9). The population is made up of Hindus of various castes who speak Dravidian languages (ibid. ix.) – mostly Kannada-speaking Kanarese – but includes a 15% Muslim minority and a small proportion of Catholics (ibid. 25). Immigration from the states of Karnataka and Andhra Pradesh is common, particularly by farmers attracted to the fertility of the land and the part-privatised irrigation system (ibid. 12). Most male residents either own pockets of farming land or work as agricultural tenants or labourers (ibid. 25). The dominant occupations are rice farming (for home consumption and local sale) and the cultivation of cash crops such as groundnut, cashew, bananas and sugar. Sorghum, split peas, sunflowers, tomatoes, cucumber and eggplant are also grown (ibid. 25). Other widely held occupations in Anegondi include trade and government services (ibid. 186f.). A small number of people practise crafts such as pottery-making and metal-smithing (ibid. 38).

c) A typical residence consists of a single-storey, flat-roofed, multi-roomed rectilinear building, containing one or more kitchens and several multifunctional verandas and enclosed halls; a cattle-shed and unroofed yard may be attached to the residence by means of a low-walled fence (see Figure 4.3 for the plan of N1042). The smallest residences have walls of mud or wattle-and-daub, and a ridged roof made of thatched date or palm fronds; all other residences have stone walls, and a flat roof that rests on wooden columns and is made of layers of wood, stripped bamboo, palm matting, stone and mud (ibid. 60). While concrete may sometimes be used for floors, local materials predominate: these include granite procured from the surrounding hills, coconut fibres for lashing together thatch, and bamboo for the cross members of roofs and for doors (ibid. 63). Individuals often acquire building plots through the traditional system of partible inheritance (ibid. 31), but if they are on a low income they may instead be allocated some land by the government, and receive financial assistance for construction costs (ibid. 60). Immigrants can also acquire free empty plots in any part of the community by applying to the local authorities (ibid. 5). All construction activities are carried out by people of the house-building Vaddaru caste, who are available for hire on a daily basis (ibid. 60). Although there appear to be no formal planning regulations, specialists who are well-versed in traditional architectural treatises may be hired to direct the layout and construction of new residences (ibid. 63); in the case of the largest residences, professionally trained architects are commissioned for the design (ibid. 70). A residence is likely to be expanded over time as funds are accumulated and adjacent plots become available (ibid. 68), but modification and subdivision are also commonly practised when

property rights are passed on to the head's heirs (ibid. 74). More rarely, a residence may be let out to immigrants (ibid. 168) or sold (ibid. 152).

Pobia

Information about Pobia's domestic architecture is derived from Trova's catalogue of plans, which was made in 1986-7 with the purpose of exploring diachronic changes in the community's spatial organisation (Trova 1989). Her study comprises the spatial analysis of residence layouts, and is part of a still unpublished larger-scale investigation of the social and physical transformations that have taken place in the community over the past few decades. As with the present study, it uses Burgel's earlier socio-geographic study as a basis for reference (Burgel 1965).

a) The settlement is situated in the Messara plain of southern Crete in Greece, and has been occupied on a year-round basis since at least the end of the 19th century. Pobia's buildings extend over an area of approximately 30ha, and include a post-office, mayor's office, primary school, police outpost and two churches (Burgel 1965: Plan 1). General stores, groceries, bakeries, a butcher's shop, restaurants and coffee-shops are located along the main streets (Trova 1989: 10). It is unknown whether the cinemas, orphanage, college, and small-scale soap manufacturing establishment that operated in the 1960s (Burgel 1965: 19, 20, 18) still existed by the time that Trova carried out her fieldwork. All occupied residences are supplied with running water and electricity, and 85% of co-residential groups have televisions (Trova 1989: 75). The inhabitants of Pobia use the administrative, educational and commercial services offered by the nearby regional centre of Mires, and shop in its large weekly street market (Trova 1989: 10). Daily travel to Iraklion, the capital of the prefecture in which Pobia is located, is also common (ibid. 63).

b) Excluding weekend and holiday residents, the population of Pobia numbers around 1,500 (Trova 1989: 10). The inhabitants are Greek-speaking Cretans who practise Orthodox Christianity. The majority of inhabitants derive their income from agriculture (ibid.), although even in the 1960s there were few who relied on this exclusively (Burgel 1965: 63). Fields are mainly planted with vines and olives, and greenhouse nurseries are used to cultivate tomatoes; in addition, potatoes, various legumes, cereals and fruit (particularly bananas and citrus fruits) are commercially grown. Many inhabitants commute to Mires or Iraklion where they work in the tertiary sector or are employed in the processing and packaging industry.

c) A typical residence, whether of new construction or of the renovated old-style, consists of a flat-roofed rectilinear building with a fenced front or back yard, containing a living room, kitchen, bathroom, parlour, and one or more bedrooms. Bedrooms and parlours are occasionally situated on an upper storey and reached via an internal staircase, an external staircase, or both (see Figure 4.4 for the plan of P1021). The terrain on which Pobia is built slopes slightly, and some multiple-storey residences are cut into the slope at both their lower and upper storeys; upper storeys, however, are never accessed directly from the higher ground, but may only be reached via the lower storey. Whilst the stone used for the older residences was procured locally from the Asterousia mountains, most modern construction and modification uses industrially manufactured imported materials such as concrete and brick (Burgel 1965: 13), and prefabricated building parts such as aluminium window shutters (Trova 1989: 10). Until the mid-1960s residence owners participated in the design process and hired masons to carry out construction using traditional techniques; more recently, university-trained architects have been designing residences, and all plans require the approval of a professional engineer (ibid. 63). Despite the requirement of formal building permission, Trova reports that owners often intervene during the construction process to change authorised plans (ibid. 64). Residences and building plots are privately owned and examples are known to have stood for as long as 100 years; during their life-use it is possible for owners to pass them on to their children in the form of dowry or inheritance, or to sell them (Burgel 1965: 13). Often, however, heirs prefer to build a new residence rather than repair an old one (ibid. 11), so some residences have either been left to collapse, or have been converted to storage annexes for the use of residents in other parts of the settlement (ibid. 13).

Karapinar

Data regarding Karapinar was collected in 1984 as part of an ethnoarchaeological study of communities living in an area that was about to be flooded by the construction of a dam. The primary purpose of the study was to aid the interpretation of a Neolithic site excavated in the vicinity (Aurenche et al. 1997).

a) Karapinar is located in the Malatya province, in the basin of the Lower Euphrates in Turkey. Its buildings extend over an area of approximately 3.2ha (ibid. 218, Figure K1). The community is believed to date back roughly to the start of the 20th century (ibid. 260), two or so generations after the establishment of a neighbouring community known as Kiyicak, with which it is administratively tied (ibid. 10). The Kiyicak cluster belongs to the administrative district of Kale (ibid. 35), and is under the jurisdiction of Malatya, a commercial centre accessible by daily bus, where some residents work on a seasonal basis and shop for their essential goods (ibid. 74). The residents of Karapinar have access to a school, two mosques

and a couple of tiny grocery-shops in two of the other communities within the Kiyicak cluster (ibid. 13). There is a district police station and clinic close by (ibid. 74), but Karapinar itself has no public buildings, and has not been supplied with electricity or an asphalt road because of the impending flooding (ibid. 14); there is a communal drinking fountain (ibid. 13) and water mill (ibid. 10), but no piped water (ibid. 88). The settlement t is occupied year-round by some of its residents, but others only reside there during the spring and summer months.

b) Karapinar has 78 full-time and part-time residents, all of whom are Kurds who speak both Kurdish and Turkish (ibid. 48), and practise Islam. Over recent years there has been a gradual exodus of younger people to Malatya or Istanbul to exploit more varied job opportunities (ibid. 74), but the imminent prospect of dispossession due to the construction of a dam has prompted a further depletion of the population. Some of those who live and work in other towns return every spring or summer (ibid. 11), and are regarded as seasonal migrants rather than permanent emigrants in the present research. Karapinar's population is consequently low but not demographically skewed. With the exception of the young men who are currently engaged in national military service, all the inhabitants are at least partly dependent on agriculture for their livelihoods: they grow wheat for local consumption, but survive primarily on the cultivation of cash crops, including apricots, willow, poplar and mulberry (ibid. 11). Approximately half the inhabitants own some agricultural land; the remainder are sharecroppers for the three main land-owning families of the area, two of whom live outside Karapinar (ibid. 260, Table K.3). In addition, most co-residential groups own a small number of sheep and cows which they raise for their milk-products and wool (ibid. 73). Most of the inhabitants who reside part-time in Malatya or Istanbul work in the dried apricot or leather industries (ibid. 74), in the textile industry (ibid. 225), in retail or construction (ibid. 74), or in government posts (ibid. 245).

c) A typical residence consists of a flat-roofed, rectilinear, multi-roomed building, made up of one or more reception rooms and bedrooms, and sometimes a kitchen and storeroom; other storerooms and stables may be located opposite or adjacent to this, but cannot be accessed from within the rooms of the residence. Larger residences bind these components together using a wooden fence or a high mud or mudbrick wall (see Figure 4.4 for the plan of R1020). Apart from imported cement, which is used sparingly, all construction materials are local: stone is used for the foundations of walls; sun-dried mudbricks are used for walls, occasionally with supporting wooden beams; and layers of poplar beams, branches, and mud are used for the construction of roofs (ibid. 77ff.). Since the 1960s all construction has been overseen by a specialist mason with his own group of helpers, but most labour is provided by members of the co-residential group (ibid. 80). No planning regulations appear to affect the residence design. Once they are built, residence rooms are known to survive for 50 years

(ibid. 239); during that time, a residence may be extended by the addition of rooms, and room functions may change (ibid. 97). Rooms are privately owned, and property rights persist even when owners are permanently absent (ibid. 233, 244); property may also be passed on as inheritance or sold (ibid. 228). Rooms or entire residences are occasionally allocated to the owner's economic dependants (ibid. 235). After a period of abandonment, a residence may be reoccupied by a relative (ibid. 223) or used by neighbours to store their wood, straw or wheat (ibid. 244, 245).

Ban Touei

The residences of Ban Touei, and the social structure of the groups occupying them, were summarily recorded in late 1972 as part of an extensive ethnographic investigation of vernacular building activities and spatial designs in the Vientiane and Louang Prabang provinces of Laos (Clément-Charpetier and Clément 1990).

a) Ban Touei is situated within the Vientiane municipality in the lowlands of Laos, and extends over approximately 1.5ha (ibid. Figure 159). As with all non-urban small-scale settlements in the country, it lacks electricity (ibid. 245), and potable water comes only from communal wells shared by sets of co-residential groups, as well as the private collection of rain water (ibid. 251, 253). The settlement was established in 1938 (ibid. 56) and contains no public buildings apart from a sanctuary (ibid. 199), but the larger community of Ban Done Noun, which is located a mere 60m away and whose original population budded off from Ban Touei (ibid. 199), has a school (ibid. 53), a monastery, refreshment stalls and general stores selling meat, vegetables and basic household items (ibid. 55). The inhabitants of both Ban Touei and Ban Done Noun fall under the administrative jurisdiction of Vientiane, the economic centre and political capital of Laos, and visit it up to once a week to purchase goods (ibid. 55, Footnote 5) and procure other services.

b) There are an estimated 60 people occupying Ban Touei on a year-round basis. With the exception of one woman and one man from Thailand (ibid. 209, 210), the inhabitants are ethnically Lao Phouen (ibid. xix); all speak Lao, practise Theravada Buddhism and respect animist spirits (ibid. xviii). The community has experienced a gradual depopulation as residents have emigrated to nearby Ban Done Noun to be closer to the main road leading to Vientiane (ibid. 56), but there has also been a recent influx of non-locals into Ban Touei, who have settled temporarily in provisional bamboo residences (ibid. 151). All the inhabitants of Ban Touei are primarily engaged in agriculture: they farm rice in the paddies that surround the community, and cultivate a variety of fruit and vegetables in the spaces around their residence, including mango, guava, bananas, oranges, lettuce and peppers (ibid. 203). Most

co-residential groups also raise a few pigs and chickens (ibid. 205). Whilst the majority of co-residential groups subsist on this produce, they can also earn cash by selling surplus rice or vegetables in Vientiane, or selling organic roofing materials (ibid. 55). One resident is known to earn a living as a blacksmith (ibid. 210), and it is possible that – as in Ban Done Noun – some young adults participate in the tertiary sector at Vientiane (ibid. 57).

c) A typical residence consists of a rectilinear structure covered by a single pitched roof or several adjoining roofs; its floor is raised 1.80-2.30m above the ground on parallel rows of wooden posts (ibid. 228) and is accessed from ground level by a ladder. Normally, this type of raised structure consists of an enclosed living area (sometimes partitioned into two rooms), a separate enclosed kitchen, and one or more verandas (no detailed plans are available from Ban Touei, but see Figure 4.4 for the plan of a residence of this description from Ban Done Noun). In similar communities, raised structures of this sort may be fenced together with subsidiary buildings used to store agricultural produce or shelter animals, but this arrangement does not occur in Ban Touei, where annexes are instead scattered around each residence within a semi-private territory which is roughly delimited by vegetation (ibid. 205). The walls of residences are made either of wooden planks or of woven bamboo, and roofs are covered with straw, bamboo or corrugated iron sheets (ibid. 71). All materials apart from the corrugated iron are local. Residences are designed according to the community's cosmological principles (ibid. 261) rather than any formal planning regulations. Every building is erected with the help of all the able-bodied men in the community (ibid. 259), none of whom has any specialist skills; the residence owner repays their labour with a feast (ibid. 315). Individuals can purchase or rent usufructory rights over a building plot from the state by gaining the approval of the community's chief, and have the right to lease the residence built on the plot. Upon the death of the owner, a residence is normally transferred to the youngest child, usually a co-resident married daughter (ibid. 259). Once built, residences may be modified (ibid. 39), but any residence that outlives its original owner and which is not passed on as inheritance is usually dismantled and the parts relocated or sold independently of the residence plot (ibid.).

Willow Lake

Information about the inhabitants and structures at Willow Lake is derived from the publication of Janes' ethnoarchaeological fieldwork, which he carried out in the spring of 1975 (Janes 1983).

a) Willow Lake is situated on a narrow stretch of land bordered by a lake to the north and a river to the south, within the basin of the Mackenzie River in the Northwest Territories of

Canada. Occupation in this location is thought to date back approximately 60 years (ibid. 17). The settlement is permanent, its residents reoccupying their residences every year from late April to early July, and again between mid-August and early December, but spending the rest of the year based at the regional economic and administrative centre of Fort Norman to the south-west, where they can purchase goods and staples, use public services and schools, and attend religious functions (ibid. 16). Willow Lake extends over 0.1ha (ibid. 17, Figure 4), lacks modern utilities and any communal structures, and can only be accessed by a trail or over water.

b) There are 35 inhabitants in Willow Lake, all of whom are Athapaskan-speaking Slavey Indians who refer to themselves as Dene (ibid. 14), and who practise Roman Catholicism (ibid.16). Their economic activities centre on the hunting and trapping of the animals that form the bulk of their diet: large mammals (moose, caribou and bear), small mammals (beaver, muskrat and rabbit), fowl (ducks, geese and grouse), and fish (ibid. 71). These activities are supplemented by the gathering of plant foods, of non-food essentials such as water and wood, and of non-essentials such as duck eggs (ibid. 76). Short-lived special-purpose camps are set up some distance away from the settlement to accommodate hunting or gathering parties from the community (ibid. 83ff.). Equipment and supplies are bought using cash and credit from the sale of muskrat and beaver furs (ibid. 16), or from the occasional sale of snuff (ibid. 77).

c) A typical residence in Willow Lake consists of a single-roomed, multifunctional, rectangular log cabin with windows and a pitched roof, whose door faces south towards the river (see Figure 4.4 for the plan of W1005). Each cabin is made of local timber procured by the residents from the surrounding bush, but the most recently built residences also incorporate commercial building materials such as nails, plywood, roofing paper, and framing lumber for doors and windows (ibid. 40). In addition, every co-residential group uses a selection of other structures that are located nearby but are not spatially bounded together with the cabin, and are therefore not here considered to form part of the residence. These include wooden-framed tipis (covered with either canvas, polythene plastic, sheet cardboard, burlap, spruce boughs or birch branches – ibid. 35f.); log warehouses, which previously functioned as cabins but have been converted for storage (ibid. 35); outdoor storage stages, consisting of raised horizontal log-pole platforms covered with canvas or plastic (ibid. 48); and other outdoor temporary pole structures of various forms used to dry fishing nets or smoke hides (ibid. 51). Residences are privately owned, and constructed by their occupants with very limited aid from their neighbours (ibid. 40) on freely available land; in the absence of formal planning regulations or even strict local guidelines on layout or construction techniques, cabins and tipis can be designed in whichever way their owners prefer (ibid. 39).

Cabins are subject to regular structural maintenance, episodic relocation, and reuse as warehouses, so that their life-use can extend to 40 years or more (ibid. 26). They may also change ownership (ibid.), though Janes does not mention whether they can be passed down through inheritance. After abandonment, their logs are scavenged to be used as building materials or firewood (ibid. 25f.).

Xculoc

Detailed architectural information was collected from the community of Xculoc during 1988-9 as part of an ethnoarchaeological study. The study brought together regional archaeological data and ethnographic information from Xculoc and two other modern small-scale communities, in order to assist the understanding of prehispanic communities in the Yucatán region (de Pierrebourg 1999).

a) Situated in the north-east part of the Campeche state in the Yucatán peninsula of Mexico, the community grew around a hacienda whose lands were converted to communal property in 1936 (ibid. 47). The settlement is occupied year-round and extends over approximately 16ha (ibid. 238). Hopelchén is the administrative and economic centre of the municipality to which Xculoc belongs. Xculoc has its own rudimentary facilities, including a primary school, chapel, Evangelist temple, central well and several basic shops (ibid. 47), but it has no electricity or piped water.

b) The 312 inhabitants of the community are of Maya Indian ethnicity, and practise Roman Catholicism or Protestantism. Their livelihoods are primarily dependent on maize farming, which is carried out on government-owned land termed *ejido* (ibid. 47). Inhabitants supplement their income by raising small numbers of chickens and pigs for sale (ibid. 25), and with garden cultivation within their residences. Crops include beans, peppers, squash, various vegetables, and fruit trees such as citrus, avocado and banana (ibid. 23). No cash crops are grown, but some men earn cash for the purchase of clothes and other commodities by engaging in seasonal wage labour in regional economic centres.

c) A typical residence is delimited by a perimeter fence of dry stone walling, and consists largely of open space used for cultivation or animal keeping, and one or more free-standing elliptical or rectangular huts with pitched roofs (see Figure 4.4 for the plan of X1009). Huts are made of wattle-and-daub, have dirt floors, and their roofs are supported on wooden pillars and covered in palm leaves. All materials apart from industrial whitewashing lime (ibid. 81) are local, and the mud used in wall-building is normally procured from within the residence boundaries (ibid. 80). Building activities are carried out by members of the co-residential

group together with their neighbours and friends without specialist assistance (ibid. 16). A team of five can construct a hut in two months (ibid. 16), but the full complement of huts in a residence is built up gradually, beginning with the construction of a living room and later supplemented by a kitchen, storeroom, and more living rooms (ibid. 51). No formal planning regulations appear to affect the design of residences. Although building plots belong to the government, unoccupied land on the periphery of the community may be freely claimed for the creation of new residences (ibid. 51). The inhabitants legally hold property rights over their residences (ibid. 47), and this allows the co-residential group head to pass a residence on to his male heirs (ibid. 49) or subdivide it amongst them (ibid. 51). Alternatively, a residence may be appropriated by a relative of the head after abandonment (ibid. 60). Individual huts within the residence can survive for 30 to 40 years if their palm leaves and mortar are regularly maintained (ibid. 51), but during that time many huts are converted to storerooms or animal shelters (ibid. 52). Collapse is often hastened by the recovery of beams and stones for reuse as construction materials, and the scavenging of sticks for firewood.

APPENDIX B
Plans of the settlements in the sample

This appendix presents plans for ten of the 14 settlements in the sample: Aliabad, Baghestan, Capileira, Hasanabad, Kireyka, Anegondi, Karapinar, Ban Touei, Willow Lake and Xculoc. In each case, the sampled residences are represented in outline, labelled with the last one or two digits of their code. In the five cases where it was possible to distinguish between roofed and unroofed spaces in a settlement, a separate plan is included to give an idea of the internal layout of the sampled residences.

Note: no plans were available for the four remaining communities (Denpasar, Ibadan, Marrakech and Pobia).

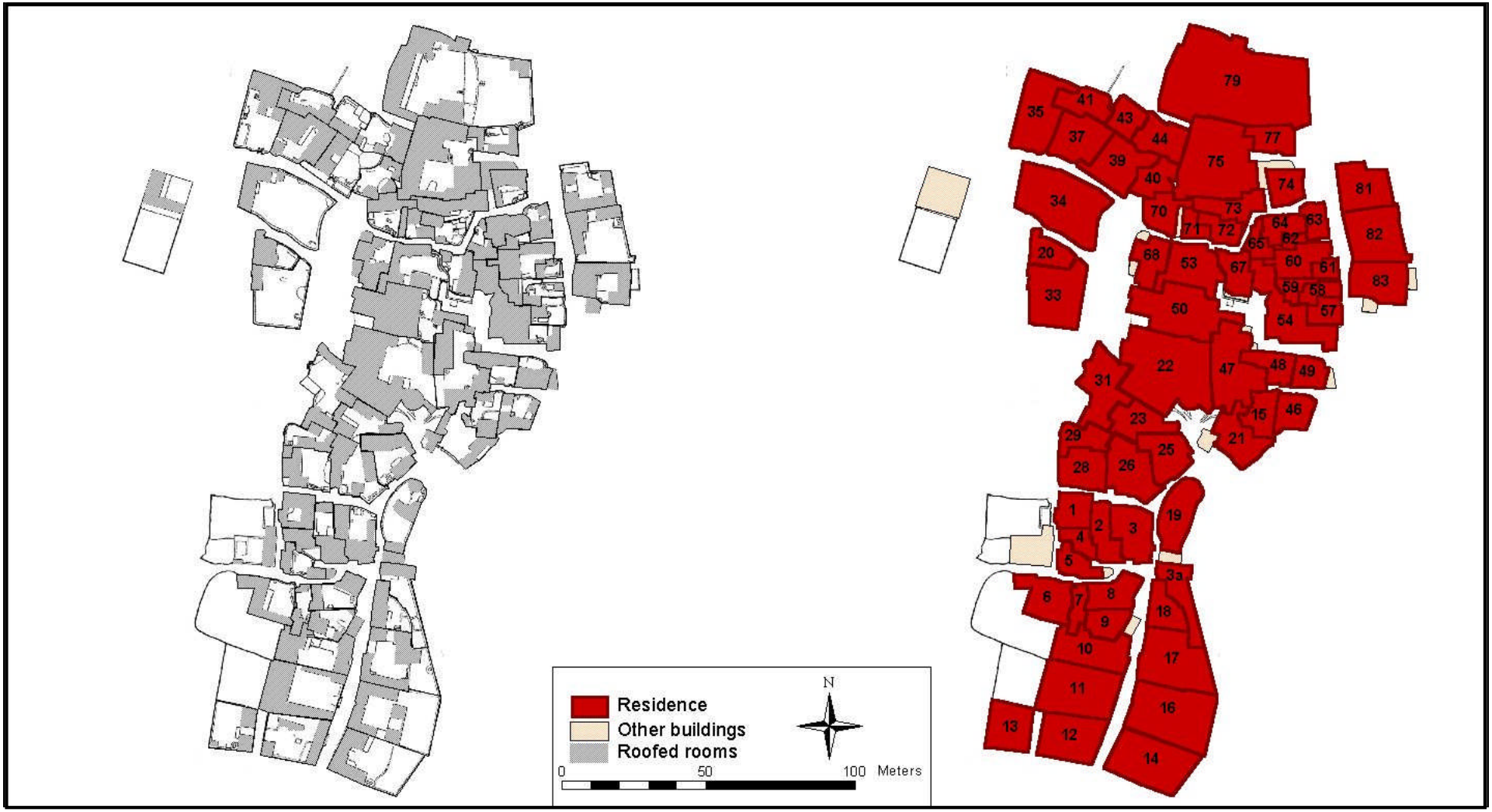


FIGURE B.1 Plan of Aliabad (left) and locations of the residences in the ethnographic sample labelled with the final one or two digits of their code (right)

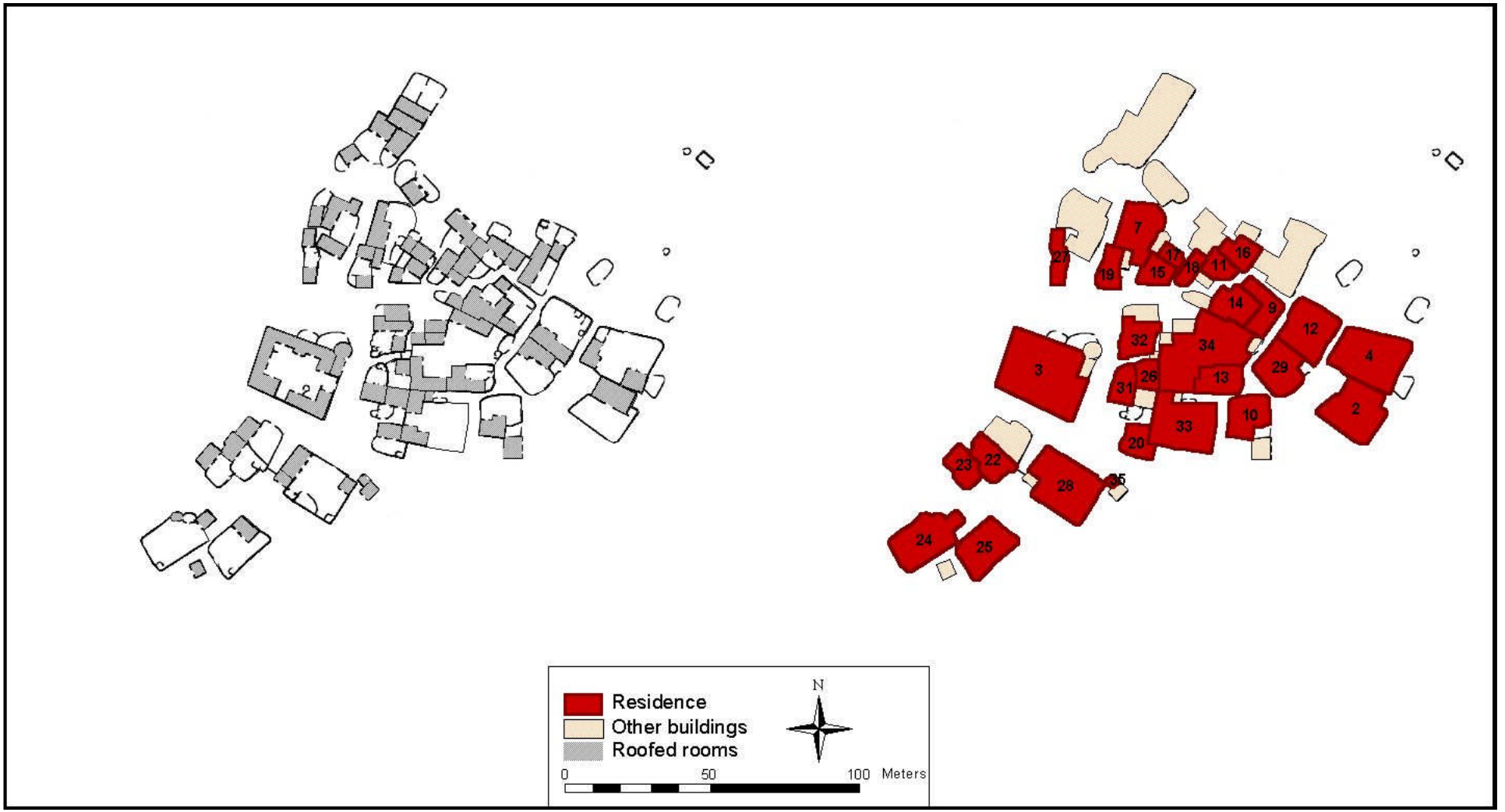


FIGURE B.2 Plan of Baghestan (left) and locations of the residences in the ethnographic sample labelled with the final one or two digits of their code (right)

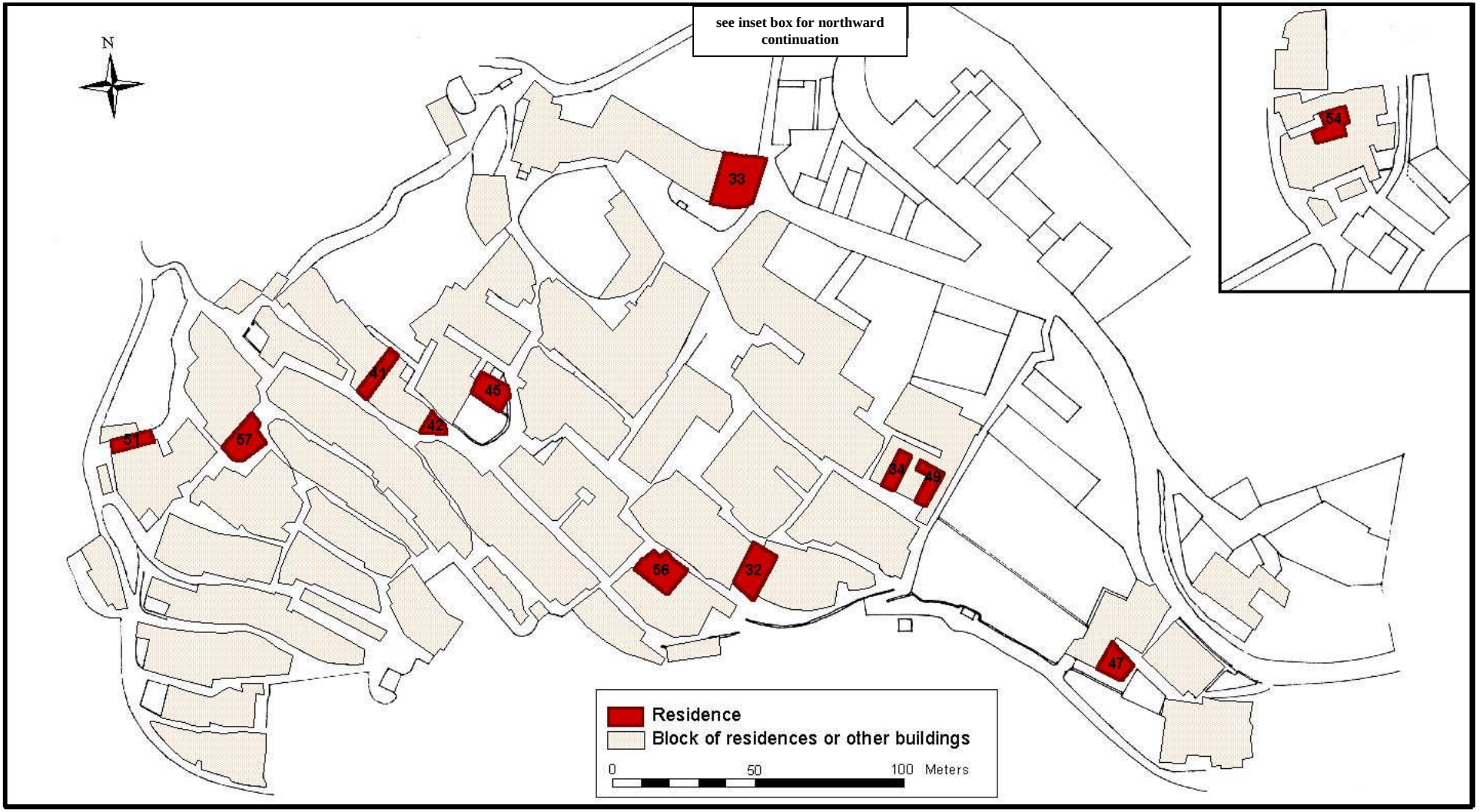


FIGURE B.3 Plan of Capileira showing the distribution of residences in the ethnographic sample. The residences are labelled with the final one or two digits of their code

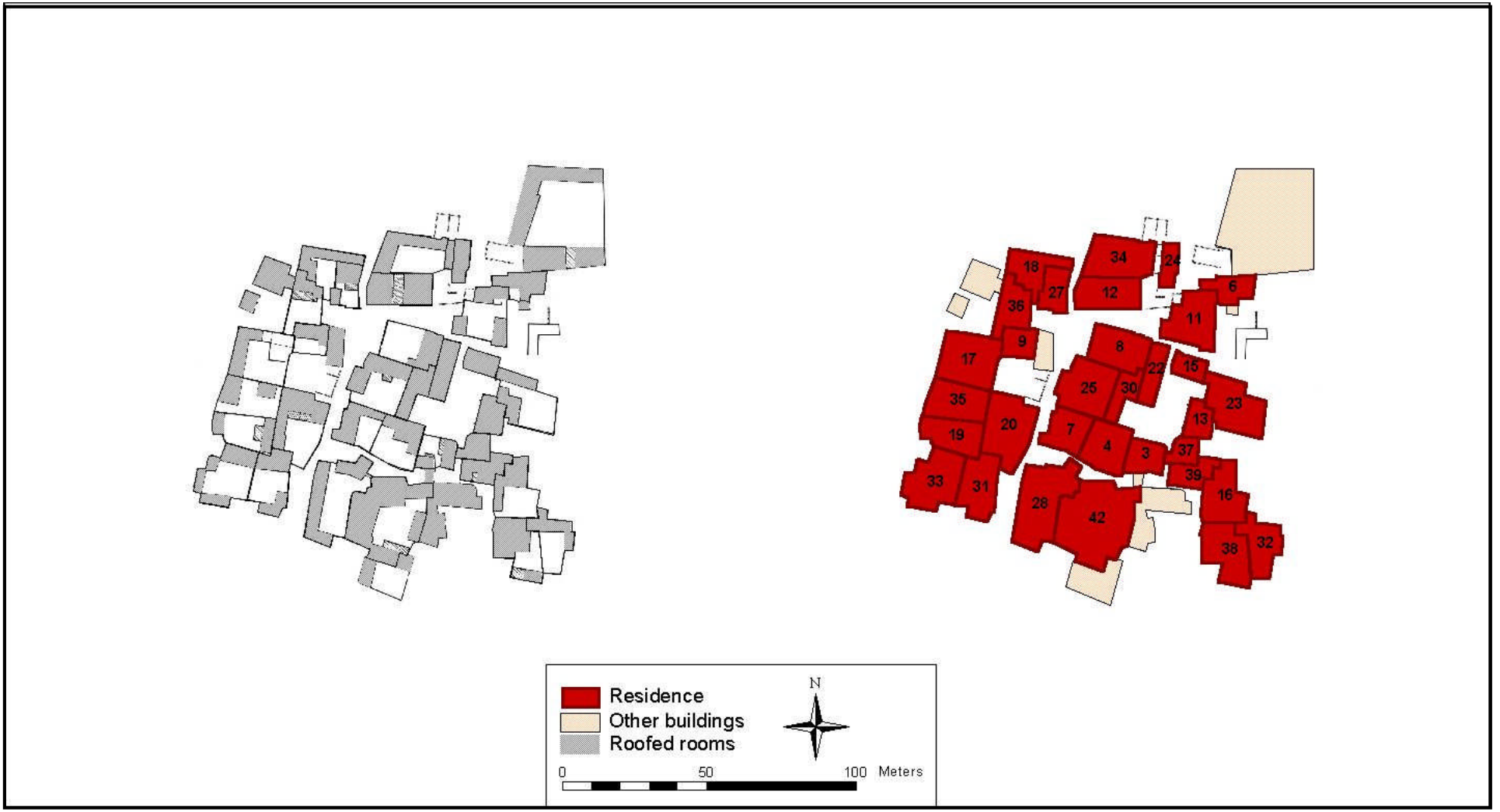


FIGURE B.4 Plan of Hasanabad (left) and locations of the residences in the ethnographic sample labelled with the final one or two digits of their code (right)

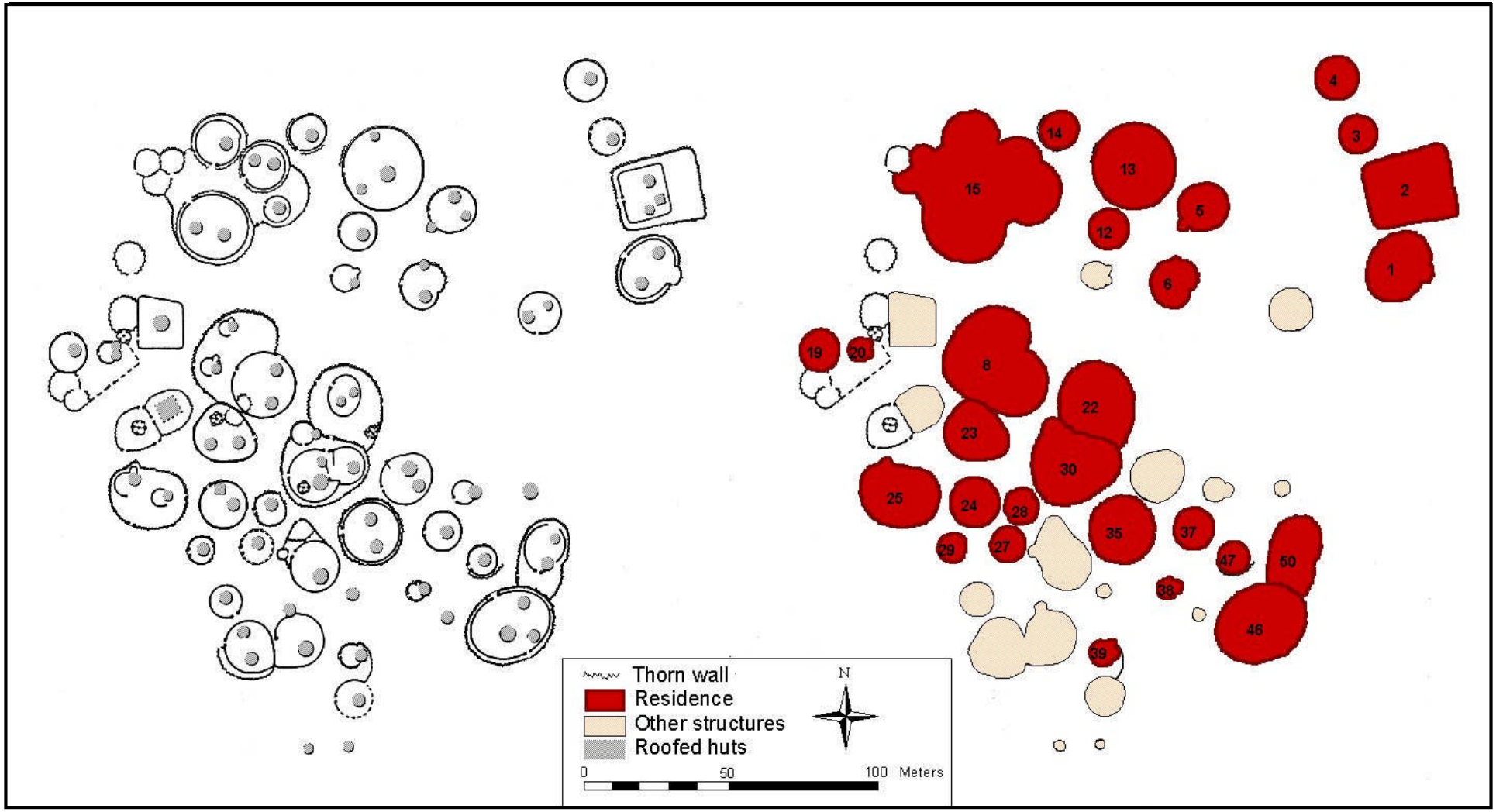


FIGURE B.5 Plan of Kireyka (left) and locations of the residences in the ethnographic sample labelled with the final one or two digits of their code (right)

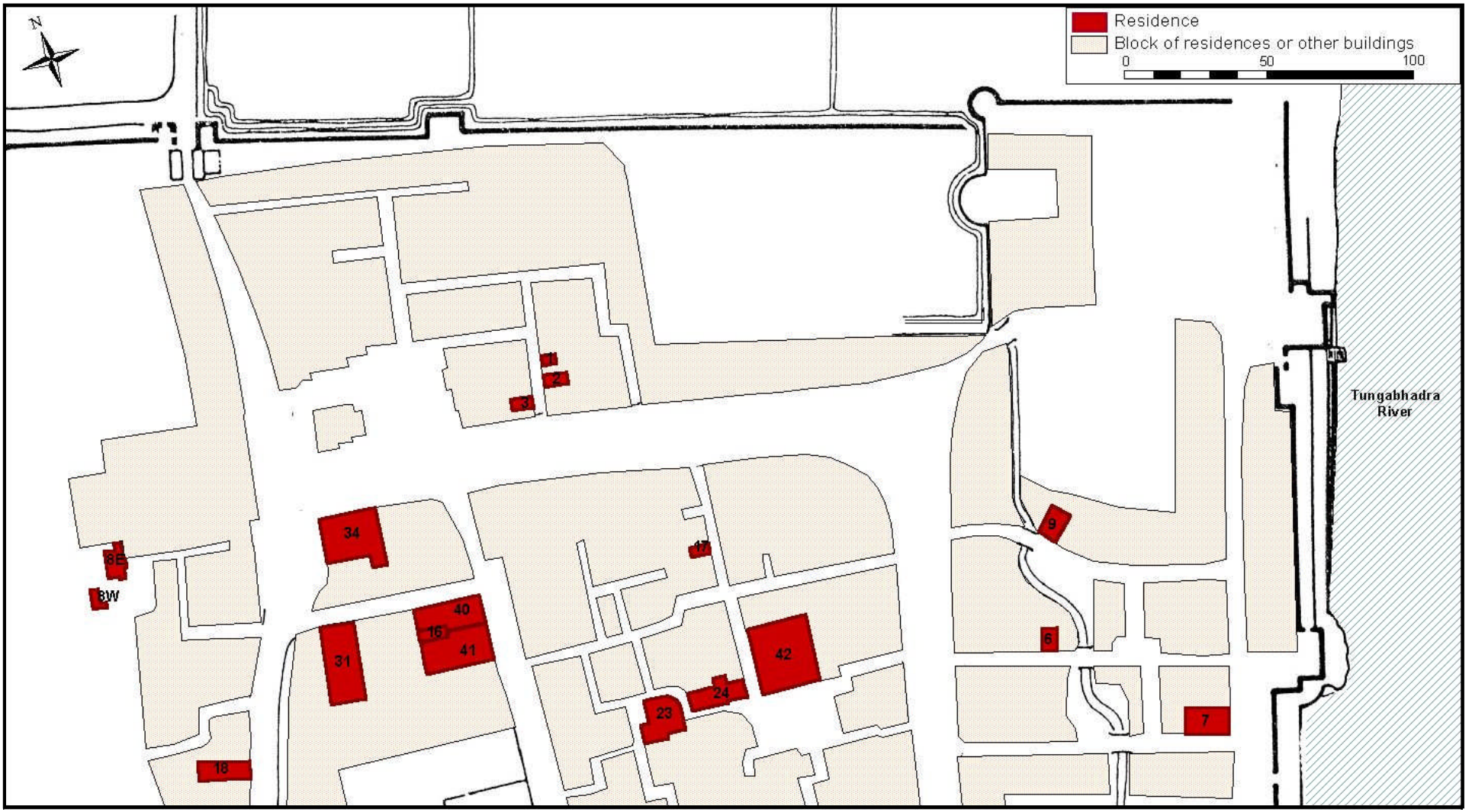


FIGURE B.6 Plan of the northern part of Anegondi showing the distribution of residences in the ethnographic sample. The residences are labelled with the final one or two digits of their code. **For the distribution of residences immediately to the south of this area, see FIGURE B.7.**

FIGURE B.7 Plan of the central part of Anegondi showing the distribution of residences in the ethnographic sample. The residences are labelled with the final one or two digits of their code. **For the distribution of residences immediately to the north of this area, see FIGURE B.6.**

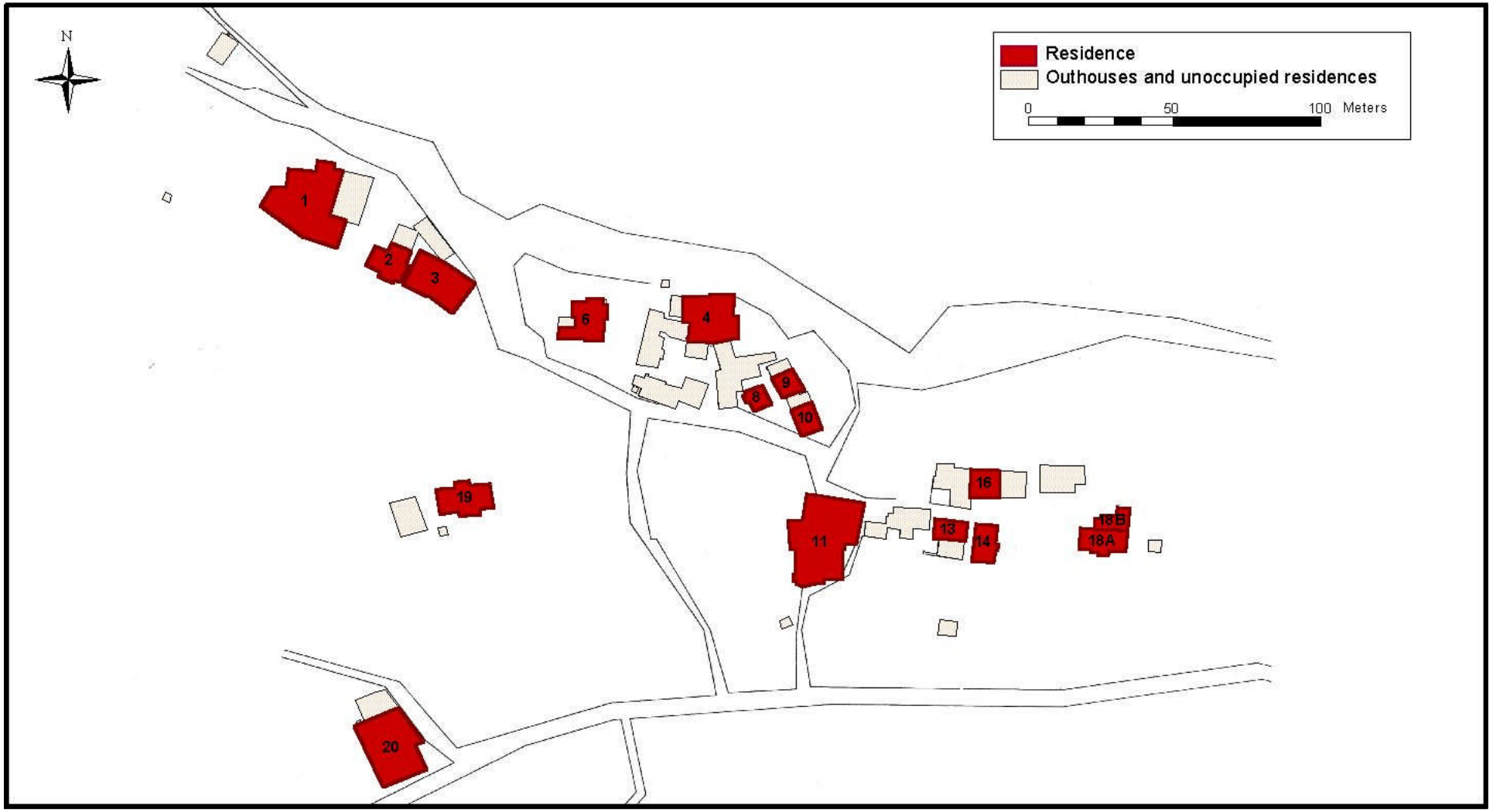


FIGURE B.8 Plan of Karapinar showing the distribution of residences in the ethnographic sample. The residences are labelled with the final one or two digits of their code. **Residence R1021, located 500m to the east of the settlement nucleus, is not shown.**

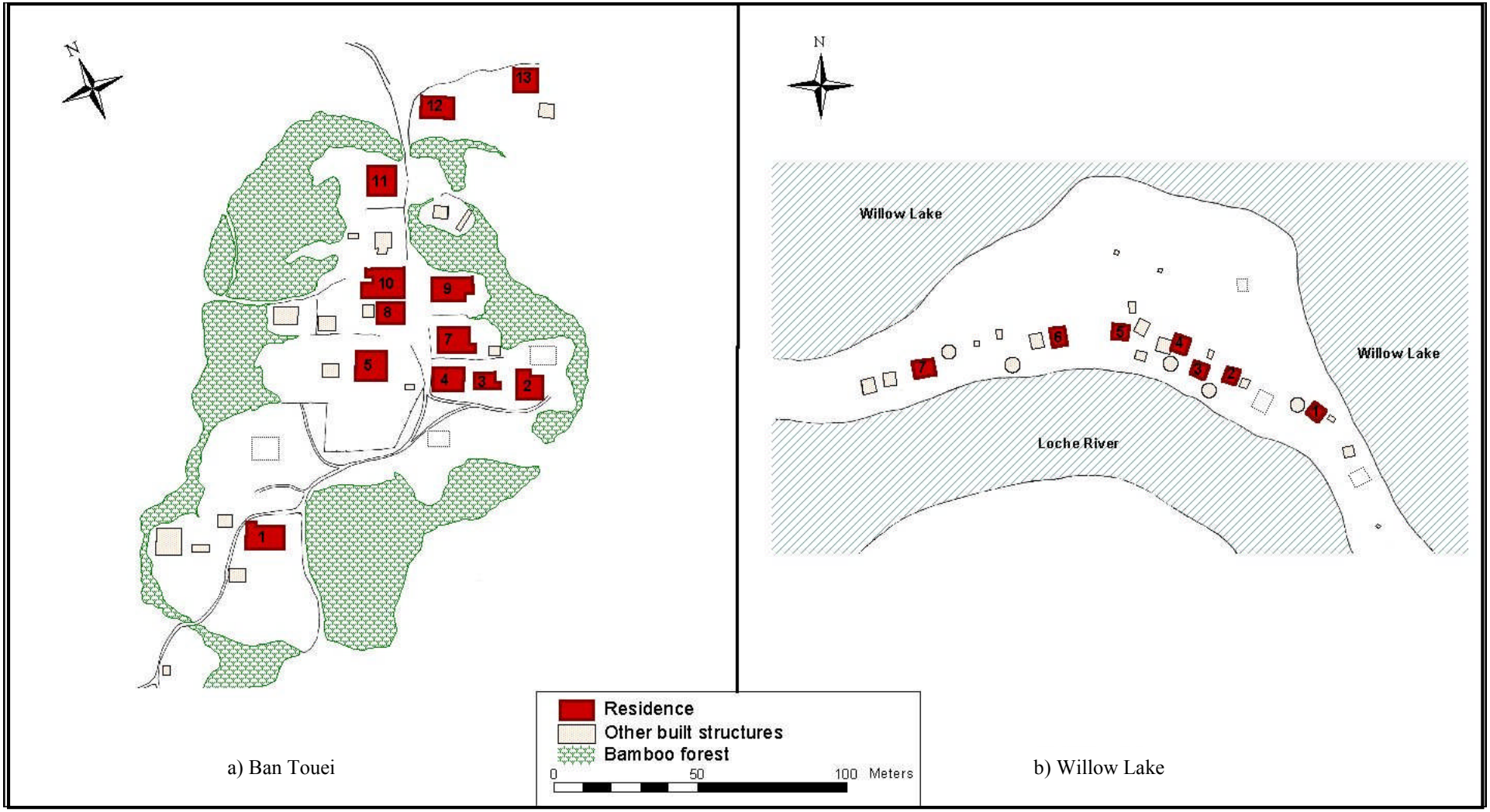


FIGURE B.9 Plans of a) Ban Touei, and b) Willow Lake, showing the distribution of residences in the ethnographic sample. The residences are labelled with the final one or two digits of their code.

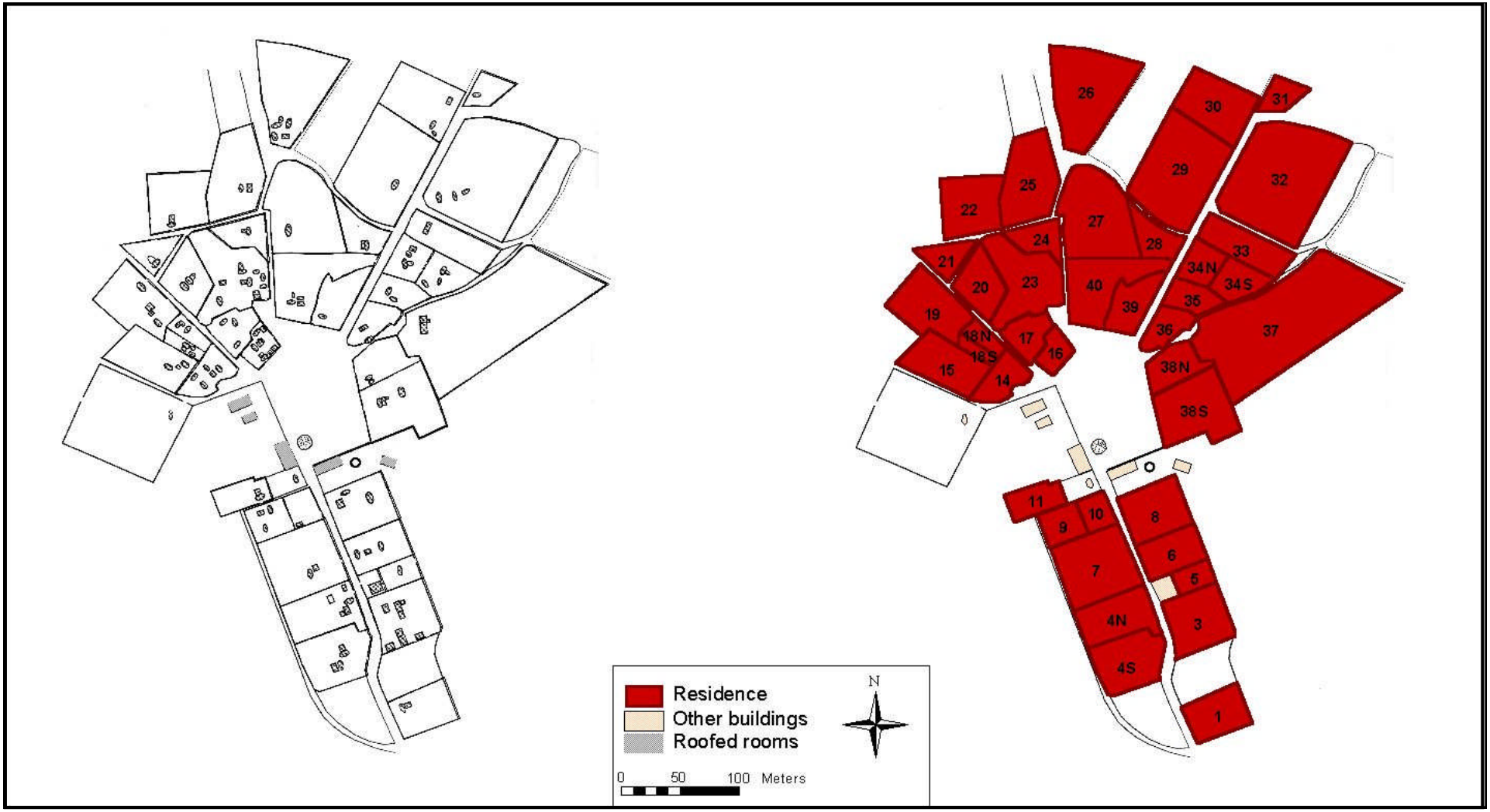


FIGURE B.10 Plan of Xculoc (left) and locations of the residences in the ethnographic sample labelled with the final one or two digits of their code (right).
Note that the scale is different to that used for the rest of the plans in Appendix B.

APPENDIX C
Information about the residences in the sample

This appendix presents information about the 368 residences in the ethnographic sample. It begins by summarising aggregate information about each community's 'dwelling area' and 'ground-plan area' (Table C.1). Detailed information about the spaces and areas in individual residences in the sample can be found in the 40-page Residence Table which follows this. A key explains what each field in the Residence Table refers to.

TABLE C.1 Summary of the areal attributes of residences in each community

Community	Residences	Dwelling area				Dwelling area per person		Ground plan area				Ground-plan area per person	
	Overall sample size	*Sample size*	Min	Max	Mean	Mean	Standard deviation	*Sample size*	Min	Max	Mean	Mean	Standard deviation
	n	*n*	m^2	m^2	m^2	m^2	m^2	*n*	m^2	m^2	m^2	m^2	m^2
Aliabad	67	*62*	12	135	55	10.2	5.8	*66*[a]	42	756	236	44.1	33.8
Baghestan	29	*29*	5	39	18	4.3	2.8	*29*	10	610	195	39.0	24.2
Hasanabad	35	*14*	11	62	25	5.3	3.7	*32*	80	630	229	49.2	33.2
Kireyka	28	*28*	7	53	19	4.9	2.8	*26*[b]	46	702	276	84.1	84.5
Karapinar	17	*11*	23	77	52	19.4	12.5	*17*	44	550	201	58.5	55.5
Willow Lake	7	*4*	20	27	23	4.4	2.0	*7*	23	35	28	6.6	2.4
Xculoc	41	*41*	15	198	50	7.7	4.1	*40*[c]	616	6,400	2,116	398.9	450.2
Capileira	12	*12*	21	75	42	15.7	8.3	*12*	37	231	87	30.9	15.4
Denpasar	13	*13*	37	217	123	9.1	3.3	*13*	105	1,950	724	54.9	53.4
Ibadan	10	*10*	43	206	109	5.7	2.9	*10*	151	569	289	15.4	6.3
Marrakech	11	*11*	18	85	55	5.1	1.6	*8*[d]	120	388	180	15.9	9.8
Anegondi	47	*47*	8	117	40	7.1	6.0	*47*	12	570	185	32.7	33.7
Pobia	39	*39*	26	91	44	†	†	*37*	12	450	173	†	†
Ban Touei	12	*12*	30	65	52	18.9	18.8	*12*	30	110	71	25.4	25.1

† Population size for most co-residential groups in Pobia not known.

[a] *Excludes residence A1079 ('ground plan area' of 1,358m^2).*

[b] *Excludes residences K1015 and K1008 ('ground-plan area' of 1,768m^2 and 948m^2, respectively).*

[c] *Excludes residence X1037('ground plan area' of 12,995m^2).*

[d] *Excludes residences M128B and M128C, both of which are located exclusively on an upper storey.*

Key to fields

- *Residence*: five-digit identifier for a residence and for the co-residential group occupying it.

- *Actual sleeping spaces*: a count of the enclosed spaces within the residence used by members of the co-residential group as sleeping accommodation during the ethnographer's fieldwork. The count includes spaces that have other designated functions but are nevertheless employed by residents for sleeping.

- *Conjugal rooms*: a count of the 'actual sleeping spaces' within the residence that are used for sleeping by pairs of conjugal partners who are members of the co-residential group.

- *Formal sleeping spaces*: a count of the enclosed spaces within the residence that have been designed as sleeping accommodation for members of the co-residential group or their visitors. The count includes spaces that were designated as sleeping accommodation but not employed as 'actual sleeping spaces' during the ethnographer's fieldwork (having been left empty, or put to use for light storage), as long as they retain the capacity to be readily restored to this use.

- *Cooking spaces*: a count of the enclosed spaces within the residence that contain cooking facilities used for the preparation of the residents' everyday meals. Any spaces whose cooking facilities are out of use, or employed exclusively for commercial or secondary cooking activities (such as food re-heating, bread-making, or tea-brewing) are excluded.

- *Eating spaces*: a count of the enclosed spaces used by members of the co-residential group for the consumption of everyday meals. Any dining rooms used on an occasional basis or exclusively for the consumption of formal meals or feasts are excluded.

- *Dwelling area*: measurement of the combined floor area of a residence's 'actual sleeping spaces', 'cooking spaces', 'eating spaces', and any other enclosed spaces used on an everyday basis by the residents for congregating. Any enclosed spaces used only on formal occasions, for specialised or commercial activities, or to assist in circulation, are excluded. Unless otherwise stated, wall thickness is excluded from the measurement.

- *Ground-plan area*: measurement of the area of all ground-level spaces which become directly or indirectly accessible once the residence has been entered. The area taken up

by their walls and the residence's perimeter wall (if this exists) is included. The measurement effectively represents the size of the residence's 'footprint'.

- *Multiple storeys*: indication of the presence of more than one storey in the residence.

- *Age*: record of the number of years since the residence was constructed, or since an episode of architectural subdivision or amalgamation gave rise to its current boundaries.

- *Manner of acquisition*: classification of the method of property transfer by which the current co-residential group head acquired the residence.
  'I' = property rights acquired without remunerating the previous owner (e.g. through inheritance, dowry, appropriation, or bequest).
  'B'= property rights acquired through a remunerative transaction or reciprocal arrangement with the previous owner (e.g. through purchase or exchange of a ready-made residence).
  'C'= property rights acquired by commissioning the construction of a new residence, or the subdivision or amalgamation of existing structures to form a new residence.
  'R' = temporary tenure rights acquired through a remunerative transaction (e.g. a rental agreement between the property owner and the current head).

- *Comments*: supplementary notes about the history, layout, or use of spaces in the residence

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
A1001	3	3	2	1	(2)	73	141	☑	30	C	the 'kitchen' is used for sleeping by the head's eldest married son and his family (Kramer 1982:119)
A1002	2	1	2	1	(2)	65	170	☑	28	(I)	the two 'living rooms' are contiguous: the conjugal couple sleeps in one, while children sleep in the other (Kramer 1982: 104)
A1003	2	2	2	1	(2)	53	253	☑	30		
A1004	1	1	1	1	1		89	☑	30		the residence has two 'kitchens', only one of which is regarded as a cooking space
A1005	(2)	1	2	1	(2)		120	☑	25	(I)	
A1006	1	1	1	1	1	50	251	☐	20	C	
A1007	1	1	1	1	1	39	112	☑	20	(I)	
A1008	1	1	1	1	1	49	182	☑	20	(I)	
A1009	1	1	1	1	1	40	141	☑	20	(I)	

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
A1010	(2)	1	2	1	(2)		301	☑	20	(I)	
A1011							449	☐	20	C	minimal information available
A1012	1	1	1	1	1		346	☐	20	C	
A1013	1	1	2	1	(2)	75	252	☐	4	C	construction of the residence was financed by the head's in-laws (Kramer 1982: 129, 121); one of the 'living rooms' is regarded as a spare sleeping space
A1014	1	1	1	1	1	43	448	☑	5	C	the residence was not inherited but either recently constructed or bought by the head
A1015	1	1	1	1	1	48	155	☑	>35		
A1016	1	1	1	1	1	52	566	☐	9	C	construction of the residence was financed by the head's in-laws (Kramer 1982: 146)
A1017	2	2	2	1	(2)		453	☑	9	C	the residence has two 'kitchens', only one of which is regarded as a cooking space
A1018	2	2	1	1	1	61	161	☑	17		the 'kitchen' is used for sleeping by one of the conjugal couples (Kramer 1982: 119)

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
A1019	1	0	1	1	1	53	250	☐	>35	(I)	the residence was probably inherited from the head's in-laws who have no sons of their own (Kramer 1982: Figure 2.2)
A1020	1	1	1	1	1	43	141	☐	3	I	the residence was part of a formerly larger residence which was partitioned to form A1020 and A1033
A1021	1	0	1	1	1	29	226	☐	>35	I	in the absence of a specialised 'living room', the 'living room/kitchen' is used for sleeping, cooking and eating; the residence was acquired as a gift (ibid. 146)
A1022	(3)	2	3	1	(3)		756	☑	>35	I	the residence has two 'kitchens', only one of which is regarded as a cooking space; a room on the upper storey is abandoned (Kramer 1982: 100)
A1023	2	2	2	1	(2)	55	215	☐	>35	B	the residence was bought by its current occupants (Kramer 1982: 146).
A1025	1	0	1	1	1	53	217	☑	>35	I	the residence was part of a formerly larger residence which was partitioned to form A1025 and A1026
A1026	2	2	2	1	(2)	81	304	☑	>35	(I)	the residence was part of a formerly larger residence which was partitioned to form A1025 and A1026
A1028	1	1	1	1	1	55	212	☑	>35	C	construction of the residence was financed by the head's father (Kramer 1982: 146)
A1029	2	2	2	1	(2)	65	160	☐	>35	B	

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
A1031	2	2	2	1	(2)		319	☐	35		the residence has two 'kitchens', only one of which is regarded as a primary cooking space (Kramer 1982: Figure 4.12)
A1033	1	1	1	1	1	35	382	☐	3	(C)	the residence was not inherited but either constructed or bought by the current head 17 years ago, and subdivided 3 years ago to form A1033 and A1020
A1034	1	1	1	1	1	61	583	☑	3	C	construction of the residence was financed by the head's in-laws (Kramer 1982: 129)
A1035	(3)	2	3	1	(3)		345	☐	10	C	the residence was constructed by the current head (Kramer 1982: 146)
A1037	2	2	2	1	(2)		275	☐	15	(C)	the residence was not inherited but either constructed or bought by the immigrant head; the residence has three 'kitchens', only one of which is regarded as a cooking space
A1039	1	0	1	1	1	43	280	☐	17	I	the residence was acquired as a gift from a relative (Kramer 1982: 146)
A103a							194	☐	1	C	minimal information available
A1040	1	1	1	1	1	18	159	☐	19		
A1041	2	1	1	1	1	67	165	☐	15	(C)	one of the two 'kitchens' is used for sleeping by the widow (Kramer 1982: 119); the head is an immigrant (ibid. 139) who either purchased or constructed this residence

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
A1043	1	1	1	1	1	41	125	☐	17	I	
A1044	2	2	2	1	(2)	42	199	☐	19	(C)	the residence was not inherited but either constructed or bought by the immigrant head
A1046	1	1	1	1	1	35	152	☐	15	(C)	the residence was not inherited but either constructed or bought by the head close to his parental residence (A1047)
A1047	(2)	1	2	1	(2)		417	☑	>35		the residence has three 'kitchens', only one of which is regarded as a cooking space
A1048	1	1	1	1	1		142	☑	10	I	the newly-formed conjugal couple sleeps in the same 'living room' as the older couple (Kramer 1982: Table 4.1); only one of the two 'kitchens' is regarded as a cooking space
A1049	2	1	1	1	1	25	115	☐	10	I	the 'kitchen' is used for sleeping by the widow (Kramer 1982: 119); the residence was part of a formerly larger residence which was partitioned to form A1048 and A1049
A1050	3	3	3	1	(3)		475	☑	>35	I	two of the three 'living rooms' are contiguous (Kramer 1982: 104), so that only two 'living rooms' are independent; the family of the head's sister sleep in the dependent room
A1053	1	1	1	1	1	65	312	☐	>35	I	the residence was acquired as a gift from a relative (Kramer 1982: 146)
A1054	3	3	3	1	(3)		366	☑	5	I	the residence was part of a formerly larger, much older residence which was partitioned to form A1054 and A1057; only one of the two 'kitchens' is regarded as a cooking space

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
A1057	1	1	1	1	1	23	101	☐	5	I	the residence was part of a formerly larger, much older residence which was partitioned 5 years ago to form A1054 and A1057
A1058	1	1	1	1	1	27	84	☐	>35	I	the residence was part of a formerly larger residence which was partitioned to form A1058 and A1059
A1059	1	1	1	1	1	25	72	☐	>35	I	the residence was part of a formerly larger residence which was partitioned to form A1058 and A1059
A1060	2	1	2	1	(2)	59	194	☑	>35	I	the two 'living rooms' are contiguous: the conjugal couple sleeps in one, while children sleep in the other (Kramer 1982: 104)
A1061	1	0	1	1	1	12	58	☐	>35		in the absence of a 'living room', the 'living room/kitchen' is used for sleeping, cooking and eating
A1062	1	0	1	1	1	25	42	☐	>35		in the absence of a 'living room', the 'living room/kitchen' is used for sleeping, cooking and eating
A1063	(2)	1	2	1	(2)		96	☑	20	(I)	
A1064	2	1	2	1	(2)	80	124	☑	>35	I	the second 'living room' is used for sleeping by the widow (Kramer 1982: 119, footnote 15)
A1065	2	2	1	1	1	40	85	☐	>35		the 'kitchen' is used for sleeping by one conjugal couple (Kramer 1982: 119)

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
A1067	2	1	1	1	1	49	146	☐	>35	I	the 'kitchen' is used for sleeping by the widow (Kramer 1982: 119)
A1068	(2)	1	2	1	(2)		172	☑	>35	I	the second 'living room' is possibly used for sleeping by the head's mother and brother
A1070	1	1	1	1	1		147	☑	>35	(I)	the residence has two 'kitchens', only one of which is regarded as a cooking space
A1071	1	1	1	1	1	21	78	☐	>35	I	the residence was acquired as a gift from a relative (Kramer 1982: 146)
A1072	1	1	1	1	1		115	☑	>35	(I)	the residence may have been inherited from the head's in-laws, who do not have sons (Kramer 1982: Figure 2.2); only one of the two 'kitchens' is regarded as a cooking space
A1073	1	1	1	1	1	33	176	☐	>35		
A1074	1	1	1	1	1		142	☐	6	(C)	the residence was not inherited but probably constructed by the current head upon quitting his parental residence; only one of the two 'kitchens' is regarded as a cooking space
A1075							638	☑	>35	(I)	minimal information available; the residence may have been inherited from the in-laws of the head's brother who have no sons of their own (Kramer 1982: Figure 2.2)
A1077	3	1	3	1	(3)		136	☑	>35	(I)	two 'living rooms' are contiguous: the conjugal couple sleeps in one, children sleep in the other (Kramer 1982: 104); only one of the two 'kitchens' is regarded as a cooking space

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
A1079	(3)	2	3	1	(3)		1358	☐	>35	I	no data on dwelling area; only one of the two 'kitchens' is regarded as a cooking space; Kramer provides only tentative activity area counts (Kramer 1982: 115)
A1081	1	1	1	1	1	40	255	☐	10	(C)	the residence was not inherited but probably constructed or bought by the current head
A1082	1	1	1	1	1	38	362	☐	17	(C)	the residence was not inherited but probably constructed or bought by the current head upon quitting his parental residence
A1083	(3)	1	3	1	(3)		258	☑	8	B	it is not clear whether all 'living rooms' are used for sleeping by the residents; only one of the two 'kitchens' is regarded as a primary cooking space (Kramer 1982: Figure 4.18)
B1002	1	1	1	1	1	12	310	☐	<20		
B1003	3	3	3	1	3	39	610	☑	>20		a 'living room' and storeroom are located upstairs; indoor cooking facilities are present in the 'living room' of 'household 3', but perhaps also on the upper storey
B1004	2	1	2	1	(2)	29	400	☐	<20		exceptionally, this residence has two 'living rooms'; the only indoor cooking facilities are situated in the 'living room' used by the younger brother's family
B1007	1	1	1	1	1	18	230	☐	>20		
B1009	1	1	1	1	1	30	140	☐	>20		the only indoor hearth within the residence is located in a storeroom that belongs to relatives (residing in B1014): it is unclear whether the co-residential group uses this to cook

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
B1010	1	1	1	0	1	17	170	☐	>20		there are no indoor or outdoor cooking facilites in this residence
B1011	1	1	1	0	1	11	80	☐	>20		there are no indoor cooking facilities in this residence
B1012	1	1	1	0	1	11	270	☐	>20		no indoor cooking facilities are present; although the current 'living room' is of recent construction, the original one indicates that the residence is old (Horne 1994:122)
B1013	1	1	1	0	1	11	140	☐	<20		the residence incorporates a small shop; there are no indoor or outdoor cooking facilities present
B1014	1	1	1	0	1	14	150	☐	>20		no indoor or outdoor cooking facilities appear to be present in the residence
B1015	1	1	1	0	1	17	90	☐	>20		there are no indoor cooking facilities in this residence
B1016	1	1	1	1	1	23	100	☑	>20		the 'living room' is located upstairs; cooking facilities are present in a ground-floor storeroom, but perhaps also exist on the upper storey
B1017	1	1	1	0	1	14	40	☐	>20		there are no indoor cooking facilities in this residence
B1018	1	0	1	1	1	13	60	☐	>20		

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
B1019	1	1	1	1	1	26	100	☐	>20		although the current 'living room' is less than 20 years old, the original one (now a storeroom) indicates that the residence is old (Horne 1994: 122, Figure 17)
B1020	1	0	1	0	1	10	100	☐	<20		there are no indoor cooking facilities in this residence
B1022	1	1	1	2	1	29	140	☐	<20		hearths are present in both the 'living room' and the storeroom
B1023	1	1	1	0	1	10	110	☐	<20		there are no indoor cooking facilities in this residence
B1024	1	1	1	0	1	14	300	☐	<20		unusually, the forecourt wall does not definitively bound the rooms within the residence; there are no indoor cooking facilities in this residence
B1025	1	1	1	1	1	12	240	☐	<20		
B1026	1	1	1	1	1	15	70	☐	<20		
B1027	1	1	1	0	1	15	90	☐	<20		there are no indoor or outdoor cooking facilities in this residence
B1028	1	1	1	2	1	19	390	☐	<20		hearths used for cooking are present in the 'living room' and in a small, separately located, special-purpose roofed room

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
B1029	1	1	1	1	1	28	210	☐	>20		
B1031	1	1	1	1	1	14	90	☐	<20		
B1032	1	1	1	1	1	14	140	☐	<20		
B1033	1	1	1	1	1	33	350	☐	>20		this residence possessed no forecourt until after 1976 (Horne 1994: 205); the hearth in the porch entrance is not counted as a cooking space, as it is not fully enclosed
B1034	1	1	1	0	1	13	510	☑	>20		the 'living room' is located upstairs (Horne 1994: 216); no indoor or outdoor cooking facilities appear to be present in the residence, but a hearth may exist on the upper storey room
B1035	1	0	1	0	1	5	10	☐	<20		this residence consists solely of a tiny 'living room', with no forecourt or cooking facilities
C1032	(2)	1	3	1	1	49	130	☑		I,B	the co-residential group composition suggests that one of the three 'dormitoria' is a spare; part of the residence was inherited, and another part bought (Delaigue 1988: 116-7)
C1033	4	1	7	1	1	75	231	☑		I,B	four 'dormitoria' are in use, another three are spare (Delaigue 1988: 88); part of the residence was inherited, another part was bought (ibid. 117)
C1034	1	0	2	1	1	36	37	☑			the two 'dormitoria' are contiguous: the lone occupant sleeps in one, while the other must be a spare; the residence has an extension on its upper storey suspended over a public road

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
C1041	(1)	1	3	1	1	27	76	☑			the co-residential group composition suggests that two of the three 'dormitoria' are spare; one of these appears to be a multi-functional hall and so contributes to the dwelling area
C1042	(2)	1	3	1	1	33	43	☑			the co-residential group composition suggests that one of the three 'dormitoria' is a spare
C1045	3	1	3	1	1	44	92	☐			the residence appears to be a self-contained first-floor flat, with a first-floor entrance and no internal access to any other storey
C1047	1	0	2	1	1	25	62	☑		R	since there is a single occupant, one of the two 'dormitoria' must be a spare; the residence is leased to its current occupant, free of charge (Delaigue 1988: 115)
C1049	2	1	2	1	1	49	77	☑			
C1051	1	1	1	1	1	38	41	☑			it is assumed here that the renovated upper storey contains all the residence's 'dwelling area'; the open-plan 'cocina'/'comedor' constitute a single space ('cooking space' and 'eating space')
C1054	(1)	1	2	1	(2)	21	73	☑		I,B	the co-residential group composition suggests that one 'cocina' is used as a living room and one 'dormitorio' is spare; part of the residence was inherited, part bought (Delaigue 1988: 117)
C1056	2	1	2	1	1	41	110	☑			the residence incorporates a commercial space on the ground floor; the two 'dormitoria' are contiguous: the conjugal couple sleep in one, while the children sleep in the other
C1057	2	1	2	1	1	64	111	☐		R	the residence appears to be a self-contained first-floor flat, with a first-floor entrance; the residence owners are not its current occupants (Delaigue 1988: 169)

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
D1001	7		6	2	0	119	1950	☐		I	the residence incorporates a commerical space; a commercial storeroom is used for sleeping by the live-in domestic servant (Lancret 1997: 202)
D1002	9		9	2	0	109	637	☐			the smaller building complex in the residence is built of temporary materials and belongs to the immigrant relatives of the head (Lancret 1997: 154)
D1003	21		21	6	1	217	1618	☐	>40	I	the residence consists of a "house of origin" and three subsequent extensions
D1005	5		5	1	0	145	431	☐		B	the residence that adjoins this residence was originally built as its extension, but access to it was blocked off and both parts were sold off separately in the 1980s (Lancret 1997: 167)
D1006	13	1	14	3	0	162	1333	☐		I	the residence incorporates several commercial spaces, a 'cuisine' used exclusively by the shopworkers, and a spare 'kamar tidur'
D1007	8	1	10	1	0	106	775	☑	>50		the residence incorporates several commercial spaces on its ground floor, with two spare 'kamar tidur' situated above them (Lancret 1997: 208)
D1011	13		13	2	0	164	617	☐	>70	I	the residence incorporates three rooms used for commercial purposes (Lancret 1997: 196)
D1012	10	4	9	3	1	128	371	☑	22		the residence incorporates a commercial space and a separate building complex that accommodates lodgers; the stairwell is used for sleeping by the live-in domestic servant
D1014	13	0	12	3	0	176	859	☐	>40	I	the residence consists of a "house of origin" and a subsequent extension; the residence incorporates a commerical space; one resident sleeps in the tabernacle

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
D1015	6		6	2	0	91	333	☐	37		the residence incorporates three spaces used for commercial purposes (Lancret 1997: 249)
D1017	6		6	1	0	77	254	☐			the rooms bordering the street and the family temple are not accessible from within the residence, and are excluded from the calculation of the residence area
D1025	3	1	4	1	1	37	134	☐	15	C	one 'kamar tidur' is indicated as a spare (Lancret 1997: 252)
D1026	5	2	5	1	1	72	105	☑	11	C	the residence incorporates a food-related commercial space, and an 'actual sleeping space' for the people who work there
H1003	1	1	3	1	1		140	☑			one of the three 'living rooms' was recently built to replace an existing one, but the old room has not yet been converted to a storeroom (Watson 1979: 292)
H1004	1	1	1	1	1	31	240	☐			the residence is currently undergoing extensive remodelling (Watson 1979: 121)
H1006	1	1	1	1	1		130	☐			
H1007	1	1	1	1	1	15	190	☐			
H1008	1	1	2	1	1	17	260	☐			depending on the season, either the 'utility room' or the 'living room' is used as a cooking space (Watson 1979: Fig.5.9); the 'utility room' is regarded as a spare sleeping space

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
H1009	2	2	3	2	2		120	☐			one of the three 'living rooms' is for everyday use by the head's family, one is used as a parlour, and one is rented by a genderme and his family (Watson 1979: 292)
H1011	1	0	2	1	1		290	☐			the settlement plan indicates that one 'living room' was rented out to a genderme and his family (Watson 1979: Fig. 2.1), but this did not happen until later in the year (ibid. 40)
H1012	1	1	1	1	1		240	☐			the residence entrance was modified so as to access the residence independently rather than from the courtyard of H1029 (Watson 1979: 40); one room is ruined (ibid. Fig.2.1)
H1013	1	0	1	1	1	20	110	☐			both the hearth in the 'living room' and that in the 'aywan' appear to be used for cooking (Watson 1979: Fig. 5.11), but the latter is regarded as a secondary cooking space
H1015	1	1	1	1	1		80	☐			the residence has no courtyard wall
H1016	2	0	2	2	(2)	32	250	☑			both 'living rooms' are used for sleeping (Watson 1979: Figs. 5.13, 5.27); the hearth in the western 'living room' as well as that in the'aywan' are used for cooking (ibid.)
H1017	1	1	2	1	1	19	340	☐			the residence incorporates three rooms in a ruinous state (Watson 1979: Table 5.2); later in the year, the 'living room'/parlour was rented out (ibid. Fig.2.1)
H1018	2	2	2	2	2		190	☐			the residence appears to have been part of a formerly larger residence that was partitioned to form H1018, H1027 and H1036
H1019	1	0	2	1	1	11	220	☐			the little-used 'utility room' with the hearth on the western edge of the courtyard (Watson 1979: 138) appears to be a former 'living room', and is regarded as a spare sleeping space

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
H1020	1	1	2	1	1	11	360	☐		C	the residence was recently constructed by its current occupant (Watson 1979: 122)
H1022	1	0	1	1	1		130	☐			the residence has no courtyard wall
H1023	1	1	1	1	1	25	310	☐			the residence appears to have been part of a formerly larger residence that was partitioned to form H1013 and H1023
H1024	1	0	1	1	1		80	☐			the residence has no courtyard wall
H1025	2	2	2	2	2		320	☐			
H1027	1	1	2	1	1		130	☑			
H1028	2	2	3	2	2	62	430	☐			the 'living room' in the north-east corner of residence, which appears not to be in use (Watson 1979: 143), is regarded as a spare sleeping space
H1030	1	1	1	1	1		120	☐			the residence has no courtyard wall
H1031	2	2	2	2	2		250	☐			one of the two 'living rooms' is shared by two conjugal couples (Watson 1979: 212)

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
H1032	1	0	2	1	1	18	210	☐			
H1033	1	1	2	1	1		320	☐			the residence incorporates two disused rooms, the larger of which seems to be a former 'living room' and is regarded as a spare sleeping space
H1034	2	2	3	2	2		300	☐			
H1035	2	1	3	2	2		250	☐			one of the three 'living rooms' is for everyday use by the head's son, one is used as a parlour (Watson 1979: 292), and one is rented by a genderme and his family (ibid. 40)
H1036	1	1	2	1	1	20	180	☑			
H1037	1	1	1	1	1	15	90	☐			the count of two 'living rooms' in Watson's Table 5.2 (Watson 1979: 154) does not correspond with the information on the settlement plan (ibid. Fig.2.1) and is assumed to be an error
H1038	1	1	2	1	1		280	☐			
H1039	1	1	2	1	1		130	☑			
H1040								☐			no data available, although the location of the residence next to H1042 is shown on the settlement plan (Watson 1979: Fig.2.1)

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
H1041								☐			no data available
H1042	3	3	5	3	3	49	630	☐			the residence incorporates the 'living room' and vestibule of 'household 21', entered from the communal yard (Watson 1979: Fig.5.18), and five abandoned rooms (ibid.154)
H1043								☐			no data available
I1001	8	4	11	0		87	399	☐	106	I	three rooms appear little-used and are regarded as spare sleeping spaces; there are no cooking facilities in any enclosed spaces
I1004	16	3	16	1		206	569	☐	45	I	an apparently empty room in the corner of the residence is regarded as a spare sleeping space; the 'reception' is used by the head's eldest son for sleeping
I1005	17	3	17	2		157	341	☐	48	I	the residence incorporates a commercial space and an empty room that is regarded as a spare sleeping space; the 'central hall' is used by two of the head's cousins for sleeping
I1006	3	1	5	0		43	156	☐	5	C	two apparently empty rooms are regarded as spare sleeping spaces; in spite of this, one of the sleeping spaces is shared by two conjugal couples; there are no indoor cooking facilities
I1009	10	4	10	0		116	246	☐		(I)	the residence incorporates a shop; two of the sleeping spaces accommodate four and two conjugal couples respectively; there are no indoor cooking facilities in this residence
I1012	5	1	5	0		83	243	☐	4	C	there are no indoor cooking facilities in this residence; the residents plan to construct an additional three rooms in the back yard (Schwerdtfeger 1982: 409)

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
I1026	4	0	5	0		88	151	☐		I	the residence incorporates a pool house; a little-used room is regarded as a spare sleeping room; there are no indoor cooking facilities
I1034	5	1	6	1		69	245	☐			there is no data on the history of this residence, but it appears to have been recently constructed; the residence incorporates a spare sleeping space
I1042	5	0	5	1		77	273	☐	8	C	the residence incorporates a commercial space
I1053	16	1	16	1		159	263	☐		I,C	this residence was part of a formerly larger residence whose construction was begun in the 1900s and which was partitioned in the 1940s (Schwerdtfeger 1982: 146)
K1001	2	1	2	1		29	410	☐	16	C	
K1002	2	0	2	1		26	702	☐		C	unusually, this residence is rectilinear in outline; the residence was constructed 2-8 years ago (Tobert 1988: 241, 238)
K1003	1	1	1	1		10	129	☐		I	the residence incorporates a new 'cooking house', which is not yet in use (Tobert 1988: 173); the residence was appropriated 2 years ago by its current occupants (ibid. 238)
K1004	1	1	1	1		16	167	☐		C	there is no data on the age of the residence
K1005	3	0	3	1		17	226	☐	10	C	the so-called 'guest house' on the residence's outer perimeter is not spare sleeping accommodation, since it is used on a regular basis by the head's widowed mother (Tobert 1988: 104)

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
K1006	2	0	2	1		18	202	☐	15	C	
K1008	3	2	4	2		39	948	☐	3	C	a thorn fence set up when the most recent 'bride house' was built delimits the residence; it encompasses three compounds aged 11, 5 and 3 years respectively
K1012	1	0	1	1		9	144	☐	11	C	
K1013	2	0	3	1		29	641	☐	13	C	the residence incorporates a spare sleeping space (Tobert 1988: 170, table 15)
K1014	1	1	1	1		10	130	☐	5	C	
K1015	5	3	6	4		53	1768	☐	4	C	a thorn fence delimits the residence; it encompasses four compounds aged 14, 11, 9 and 4 years respectively, as well as a spare sleeping space and two goat enclosures
K1019	1	1	1	1		12	147	☐		C	the residence was constructed by its current occupants upon the head's second marriage, some time within the last 6 years (Tobert 1988: 188)
K1020	1	1	1	0		10	53	☐		C	the residence was recently constructed, as its occupants are still betrothed (Tobert 1988: 109, table 3)
K1022	1	1	1	2		17	561	☐	14	C	the residence incorporates a special-purpose 'cooking house', reportedly in a run-down state (Tobert 1988: 173)

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
K1023	2	1	2	1		25	340	☐	14	C	the residence incorporates a goat enclosure (Tobert 1988: 160)
K1024	2	0	2	1		19	221	☐	14	C	
K1025	2	2	2	0		21	478	☐	3	C	a thorn fence set up when the most recent 'bride house' was built delimits the residence; it encompasses two compounds aged 5 and 3 years respectively
K1027	1	0	1	1		11	110	☐		C	
K1028	1	1	1	0		7	109	☐	8	C	
K1029	1	1	1	1		7	76	☐	6	C	
K1030	3	2	4	3		33	637	☐	4	C	a thorn fence set up when the most recent 'bride house' was built delimits the residence; it encompasses three compounds aged 16, 12 and 4 years respectively, and a spare sleeping space
K1035	2	1	2	1		25	403	☐	16	C	
K1037	1	1	1	1		10	148	☐	11	I	the head appropriated this residence (Tobert 1988: 168) after her mother emigrated in 1984 (ibid. 121)

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
K1038	1	1	1	1		12	46	☐		I	there is no data on the age of the residence; the residence was appropriated by its current occupant during the year of fieldwork study (Tobert 1988: 240)
K1039	1	1	1	0		8	67	☐	4	C	a stretch of thorn fencing runs between this residence and a neighbouring collapsed residence which was formerly inhabited by the head's mother (Tobert 1988: 117)
K1046	3	1	3	1		36	641	☐	15	C	
K1047	1	1	1	0		10	92	☐	3	C	
K1050	1	0	1	1		11	371	☐		B	there is no data on the age of the residence; the residence was bought by its current occupant 5 years ago (Tobert 1989: 240)
M1012	4	2	6	3		69	160	☑		B	two former 'sleeping rooms' are regarded as spare sleeping spaces; the residence was jointly bought by the current head and his father (Schwerdtfeger 1982: 233ff.)
M1022	3	1	3	1		46	119	☐			
M1026	3	1	3	1		54	141	☑			
M1045	4	1	7	1		75	388	☑			three seemingly little-used rooms are regarded as spare sleeping spaces; the upper storey of this residence extends over the ground floor of the neighbouring residence

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
M1062	3	2	5	1		56	139	☑			two seemingly little-used rooms are regarded as spare sleeping spaces
M1066	4	3	4	3		85	174	☑	16	C	the residence incorporates rooms that were specifically constructed in order to be rented out (Schwerdtfeger 1982: 240)
M119A	4	2	5	1		52	134	☑		B	one little-used room is regarded as a spare sleeping space; the residence was bought by its current occupant 14 years ago (Schwerdtfeger 1982: 240)
M119B	3	1	4	1		45	120	☑		I	one little-used room is regarded as a spare sleeping space; the residence was part of a formerly larger residence which was divided into M119A and M119B (Schwerdtfeger 1982: 240)
M128A	5	3	5	1		85	187	☑	17	I	the residence was part of a formerly larger residence, which was partitioned 17 years ago to create M128A, M128B and M128C (Schwerdtfeger 1982: 235)
M128B	2	1	2	1		19	11	☑	17	R	the residence is a first-floor flat with a private entrance on the ground floor; the current occupants are tenants (Schwerdtfeger 1982: 235)
M128C	2	1	2	1		18	8	☑	17	R	the residence is a first-floor flat with a private entrance on the ground floor; the current occupants are tenants (Schwerdtfeger 1982: 235)
N1001	1	1	1	1	1	12	12	☐			
N1002	1	1	1	1	1	28	40	☐	37	C	

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
N1003	1	1	1	1	1	16	52	☐			the residence area includes the area of the concrete plinth on which the building stands
N1004	1	1	1	1	1	23	54	☐			
N1005	1	1	1	1	1	15	34	☐			
N1006	1	1	1	1	1	26	36	☐			a room with a hearth labelled as a 'kitchen' in the residence plan is actually used as an annex for storing wood (Tobert 2000: 94)
N1007	1	1	1	1	1	29	170	☐		C	the residence incorporates an abandoned 'kitchen'; the residence was built by its current occupants using a government loan (Tobert 2000: 96)
N1009	1	1	1	1	1	17	96	☐			the residence has outdoor cooking facilities as well as a room with a double hearth; however, the room labelled as a 'kitchen' has no hearth and is instead assumed to be used for sleeping
N1010	1	1	1	1	1	14	39	☐		C	the residence area excludes the area of the adjacent annex built by the residents with government funding
N1011	2	2	2	2	2	41	133	☐			
N1012	2	1	2	1	1	29	110	☐			

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
N1013	2	1	1	1	1	14	40	☐			
N1014	1	0	1	1	1	8	35	☐			the enclosed part of the residence was originally a sentry room for men guarding the royal residents of neighbouring residence N1044 (Tobert 2000: 105)
N1015	1	1	1	1	1	14	59	☐			
N1016	1	1	1	1	1	33	53	☐			dwelling area includes the area of the room labelled as a 'veranda', which is in fact an enclosed living space
N1017	1	1	1	1	1	11	29	☐			
N1018	1	0	1	1	1	63	118	☐			
N1019	1	1	1	1	1	15	42	☐		I	the residence is a partitioned segment of a larger building, currently in a state of disuse, owned by the head's relatives (Tobert 2000: 110)
N1020	1	1	1	1	1	19	56	☐			
N1021	3	2	2	2	2	49	380	☐			the residence consists of two sets of rooms connected by a common garden, each of which has a separate access to the exterior

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
N1023	1	1	1	1	1	17	180	☐			both conjugal couples sleep in the same room, but a new room in the process of construction may be intended as an additional formal sleeping space (Tobert 2000: 116)
N1024	2	2	1	2	2	37	148	☐			one of the co-resident conjugal couples sleeps in one of the two 'kitchens' of the residence(Tobert 2000: 118)
N1026	1	1	1	1	1	46	119	☐		R	the residence incorporates two locked rooms, which are inaccessible to the residents (Tobert 2000: 120)
N1027	1	1	1	1	1	28	197	☐			
N1028	(2)	2	1	1	1	45	202	☐			the residence incorporates a one-room doctor's surgery, which is used by a neighbour (Tobert 2000: 124)
N1029	1	1	1	1	1	55	98	☐		C	the residence adjoins an identical residence, which was built in order to accommodate one of the coresident families but is in fact used as a cattle-shed (Tobert 2000: 126)
N1030	(2)	1	1	1	1	39	319	☐			
N1031	(2)	2	1	2	1	47	237	☐			one of the two cooking spaces is reserved for meat cooking
N1032	2	2	2	2	2	85	250	☐	80	I	the residence consists of two separate sets of rooms which share a front garden; one of the two parts is rented out to lodgers (Tobert 2000: 132)

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
N1034	(3)	2	1	2	2	36	332	☐	50	I	the residence consists of two separate buildings which share a garden; the residence has outdoor cooking facilities as well as two 'kitchens'
N1036	1	1	2	1	1	29	225	☑	12	C	the residence has a ground-floor and an upper storey 'sleeping room', but the co-residential group composition suggests that the latter is a spare formal sleeping space
N1037	1	0	1	1	1	16	83	☐			
N1038	2	2	2	2	2	47	460	☐			
N1039	(2)	1	1	1	1	73	300	☐			
N1040	2	2	2	1	1	55	214	☐	>20	I	the residence is inherited, as the father of the current head reportedly extended the residence in the 1960s to house the family of his newly married son (Tobert 2000: 146)
N1041	4	2	2	1	2	83	289	☐		I,C	the residence area excludes the two toilets situated in the back alley; two special-purpose 'exercise rooms' currently function as actual sleeping spaces
N1042	(3)	3	2	3	3	117	525	☐		B	a room labelled as a 'dressing room' in the residence plan is assumed to also be used as an actual sleeping space by the family of the head's brother who own it (Tobert 2000: 150)
N1043	1	1	2	1	1	27	442	☐		C	the residence incorporates an abandoned 'kitchen', 'living room' and store belonging to the head's absent brother, with whom the head designed the residence (Tobert 2000:154)

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
N1044	2	0	3	1	1	89	570	☑		I	the royal residence occasionally accommodates the king's family (Tobert 2000: 156), which normally resides outside Anegondi (ibid. 30); the king sleeps apart from his wife
N1046	(4)	2	2	3	1	59	522	☐			the residence has one 'kitchen' for vegetarian cooking and two separate cooking spaces for meat, as well as one unused 'kitchen'; the eldest spouses sleep apart (Tobert 2000: 164)
N1047	4	1	3	1	(2)	66	387	☐		R	the residence incorporates four locked rooms which are inaccessible to the residents (Tobert 2000: 168)
N1048	(3)	1	2	1	1	56	314	☐			
N1049	(2)	1	2	1	1	85	354	☐	90		the residence has outdoor cooking facilities as well as a 'kitchen', and a spare 'sleeping room' for guests
N108E	3	2	3	3	3	48	84	☐			
N108W	1	1	1	1	1	16	30	☐			
N133E	3	2	3	2	2	49	184	☐		I	the residence was part of a formerly larger residence, which was partitioned to create N133E and N133W
N133W	1	1	1	1	1	29	58	☐		I	the residence was part of a formerly larger residence, which was partitioned to create N133E and N133W

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
P1001	2	1	1	1	1	50	167	☐	187		the 'living room' is used for sleeping by the head's unmarried children
P1002	2	1	2	1	1	49	155	☐	117		
P1003	2	1	2	1	1	37	70	☑	117		the upper storey of the residence can be accessed both internally and via an external staircase from the street
P1004	2	1	3	1	1	50	148	☑	113		the residence incorporates one 'spare bedroom'
P1005	3	2	3	1	1	91	123	☑	107		the ground floor of the residence is laid out across two terraces, so that the rooms on the higher terrace are level with the upper storey built on the lower terrace
P1007	1	1	1	1	1	39	192	☐	97		the residence incorporates several animal shelters
P1008	3	1	3	1	1	62	153	☑	87		
P1009	1	0	1	1	1	32	74	☑	84		the single occupant sleeps in the 'living room'; the room labelled as a 'parents' bedroom' is regarded as a spare formal sleeping space
P1010	2	1	2	1	1	45	175	☐	67		

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
P1011	2	1	2	1	(2)	76	183	☑	59		the upper storey of the residence can be accessed both internally and via an external staircase from the street
P1012	1	1	1	1	1	32	96	☐	52		the residence incorporates an animal shelter
P1013	3	1	2	1	1	63	115	☐	44		the 'parlour' is used for sleeping by the head's unmarried children
P1014	3	1	4	1	(2)	51	97	☑	37		the storeroom also functions as a formal sleeping space for guests when the head's son and his family visit (Trova 1989: 33)
P1015	1	1	2	1	1	32	398	☐	34		the residence incorporates one' spare bedroom'
P1016	2	1	2	1	1	60	450	☐	32		the residence incorporates five unused storerooms
P1017	2	1	3	1	1	45	335	☐	32		the residence consists of two separate buildings which share a yard; the residence incorporates a 'spare bedroom', a spare 'kitchen', and an unused storeroom
P1018	2	1	2	1	1	40	126	☐	31		
P1019	1	1	1	1	1	40	166	☐	28		the 'living room' doubles as a 'spare bedroom'

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
P1020	1	1	2	1	1	49	289	☐	27		despite the existence of a 'spare bedroom', all the residents share a single actual sleeping space
P1021	2	1	2	1	1	43	138	☑	27		the 'parlour' doubles as a 'spare bedroom'
P1022	2	1	2	1	1	40	304	☐	24		
P1023	1	1	1	1	1	30	126	☐	22		
P1024	2	1	2	1	1	39	196	☐	22		
P1025	2	1	2	1	1	41	307	☐	19		
P1026	2	1	2	1	1	32	72	☐	17		
P1027	2	1	2	1	1	38	163	☐	16		the residence layout was not authorised by a formal building permit (Trova 1989: 40)
P1028	1	1	1	1	1	34	138	☐	14		the residents occasionally use the 'kitchen/living room' as an actual sleeping space instead of the 'parents' bedroom' (Trova 1989: 41); dwelling area includes the area of both rooms

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
P1029	1	1	1	1	1	33	46	☐	14		the residence received a building permit as a commercial establishment, but was converted to a residence during construction (Trova 1989: 41)
P1030	3	1	1	1	1	32	47	☑	13		the 'kitchen' is used for sleeping by the head's mother; the 'living room' is used for sleeping by the head's unmarried children
P1031	2	1	2	1	1	54		☑	13		there is insufficient data to calculate the residence area
P1032	2	1	2	1	1	31	330	☐	12		
P1033	1	1	1	1	1	26	20	☑	12		the residence incorporates a commercial space on the ground floor
P1034	2	1	2	1	1	43	350	☐	12		the residence layout was not authorised by a formal building permit (Trova 1989: 43)
P1035	2	1	2	1	1	42	214	☐	11		
P1036	2	1	2	1	1	42	116	☐	8		
P1037	3	1	3	1	1	52	12	☑	7		the residence is a first-floor flat with a private entrance on the ground floor; residence area excludes the area of the ground floor storeroom, which is not internally accessible

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
P1038	2	1	2	1	1	35	145	☐	6		
P1039	3	1	3	1	1	50		☐	4		the residence is a second-floor flat with a private entrance on the ground floor; there is insufficient data to calculate the residence area
P1040	1	1	1	1	1	50	172	☐	4		
R1001	3	2	3	2	(2)	64	480	☑		I,C	the residence incorporates a large courtyard; unusually, the residence possesses an upper storey
R1002	1	0	2	1	(2)	44	125	☐		C	a room designated as guest accommodation is regarded as a spare formal sleeping space
R1003	1	1	1	0	1	27	252	☐		B	there are no indoor cooking facilities in this residence; the residence was bought by its current occupants 9 years ago (Aurenche et al. 1997: 228)
R1004	1	0	2	1	1	50	272	☐	44	C	a room used for light storage is regarded as a spare formal sleeping space; a room used exclusively for baking bread is not regarded as a primary cooking space
R1006	2	1	1	0	1	26	147	☐			there are no cooking facilites in this residence, since the adjoining 'cuisine' is not internally accessible; exceptionally, a resident sleeps in the front vestibule
R1008	1	1	1	0	1	23	44	☐	4	C	there are no cooking facilities in this residence

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
R1009	1	0	1	1	1	38	52	☐		C	a room which formerly belonged to this residence has been blocked off and appropriated by the neighbours in R1008 (Aurenche et al. 1997: 239)
R1010	1	1	1	1	1		74	☐		C	the 'pièce d'accueil' doubles as a cooking space
R1011	2	2	3	1	(2)	76	550	☐	54	I,C	the residence incorporates three unroofed yards and a spare formal sleeping space
R1013	1	0	1	1	1	70	84	☐			dwelling area could not be measured, but is reported in Aurenche et al. (1997: 244)
R1014	1	1	2	1	1		91	☐			a room that was formerly used as a 'chambre à coucher' is regarded as a spare formal sleeping space
R1016	2	1	2	1	1		90	☐		I	
R1019	1	1	2	1	(2)		155	☐	24	I	a room designated as guest accommodation is regarded as a spare formal sleeping space
R1020	2	1	2	1	(2)	77	396	☐	34		the residence incorporates a large courtyard
R1021	2	0	3	1	1	64	430	☐	34	C	a room designated as guest accommodation is regarded as a spare formal sleeping space; the residence is located 500m away from the settlement nucleus (Aurenche et al. 1997: 251)

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
R118A	2	1	2	1	1		105	☐		I	the residence was part of a formerly larger residence which was partitioned to form R118A and R118B
R118B	1	1	1	1	(2)		64	☐		I	the residence was part of a formerly larger residence which was partitioned to form R118A and R118B
T1001				1	1	65	90	☐	>20	I	the residence is inherited, as the current head and an elder sister who resides elsewhere were reportedly born there (Clement-Charpentier and Clement 1990: 210)
T1002				1	1	40	60	☐			
T1003				1	1	30	30	☐			
T1004				1	1	60	70	☐	>20		
T1005				1	1	60	80	☐	>20		a built fence borders the southern side of this residence and its neighbour ("6" in Clement-Charpentier and Clement 1990: Fig. 159), but does not form a complete enclosure wall
T1007		0		1	1	55	80	☐	>20		
T1008				1	1	35	50	☐		I	the composition of the co-residential group suggests that the residence is probably inherited

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
T1009		0		1	1	60	90	☐	>20		
T1010				1	1	60	110	☐	>20		
T1011				1	1	65	80	☐	>20		
T1012		0		1	1	55	60	☐	10	C	the residence was constructed by its current occupant and her former husband (Clement-Charpentier and Clement 1990: 209)
T1013				1	1	35	50	☐		C	
W1001	1	1	1	1	1		26	☐	1	C	the cabin was built with government funds; no data is available for dwelling area
W1002	1	1	1	1	1	22	23	☐	0	C	a wall-tent temporarily functions as a residence while a new cabin is in the process of being constructed; the residents share a tipi with W1003
W1003	1	1	1	1	1	27	29	☐	40	C	the cabin was originally built on the nearby island and then moved to its current location (Janes 1983: 26)
W1004	1	1	1	1	1		29	☐	1	C	the cabin was built with government funds next to the residents' old cabin, which was converted to a 'warehouse'; no data is available for dwelling area

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
W1005	1	1	1	1	1	20	26	☐	1	C	the cabin was built with government funds next to the residents' old cabin, which was converted to a 'warehouse'
W1006	1	1	1	1	1	21	31	☐	1	C	the cabin was built with government funds next to the residents' old cabin, which was converted to a 'warehouse'
W1007	1	1	1	1	1		35	☐			no data is available for dwelling area, residence age or the manner in which the residence was acquired
X1001	1	1	1	1	1	35	1820	☐	>20		
X1003	2	2	2	2	2	82	3000	☐	>20	C	the residence incorporates two unused rooms; one 'logis' also functions as a primary cooking space for some residents
X1005	1	1	1	1	1	21	680	☐	1	C	a notional boundary separates this residence from the territory of the Evangelical temple, although both are enclosed by a single wall (de Pierrebourg 1999: 48)
X1006	1	1	1	1	1	34	1750	☐	>50	(I)	
X1007	1	1	1	1	1	39	3420	☐	>50	(I)	
X1008	2	1	2	1	2	66	2300	☐	>20	C	the residence has both a 'cuisine' and outdoor cooking facilities, but the conjugal couple uses only the latter on a regular basis (de Pierrebourg 1999: 57)

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
X1009	2	2	2	1	2	72	900	☐	<10	C	the residence has both a 'cuisine' and outdoor cooking facilities: the older couple uses the former whilst the younger couple uses the latter (de Pierrebourg 1999: 57)
X1010	1	1	1	1	1	18	660	☐	<10	C	the residence was part of a formerly larger residence, aged over 50 years, which was recently partitioned to create X1009 and X1010 (de Pierrebourg 1999:56)
X1011	1	1	1	1	1	42	1171	☐	5	C	
X1014	2	2	2	1	1	56	1657	☐	>50	I	the residence was part of a formerly larger residence, which was partitioned to create X1014, X1015, X118N, X118S and X1019; the residence incorporates one unused room
X1015	2	2	2	1	1	54	2362	☐	24	I	
X1016	3	3	3	2	2	117	765	☐	>20		the residence incorporates a shop; one resident nuclear family cooks and eats in a building situated outside this residence (de Pierrebourg 1999: 50)
X1017	2	1	2	1	1	76	1316	☐	45	C	one of the two 'logis' accommodates both conjugal couples (de Pierrebourg 1999: 49)
X1019	3	2	3	1	1	69	2246	☐	>50	I	
X1020	2	2	2	1	1	43	2350	☐	20		the residence has both a 'cuisine' and outdoor cooking facilities: the head's family uses the former whilst his sister's family uses the latter (de Pierrebourg 1999: 57)

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
X1021	1	1	1	1	1	15	800	☐	0	C	unusually, the residence does not have a surrounding stone fence but is instead delimited by public pathways
X1022	1	1	1	1	1	44	2550	☐	>10	C	
X1023	7	6	7	5	6	198	3327	☐	>50		the residence incorporates a shop; one of the three 'cuisines' is shared by two nuclear families (de Pierrebourg 1999: 50), whilst another family uses oudoor cooking facilities (ibid. 57)
X1024	1	1	1	1	1	25	997	☐	>10		
X1025	1	0	1	1	1	44	3217	☐	>20	C	
X1026	2	2	2	1	1	71	3525	☐	5	C	the residence age is not given in de Pierrebourg's Table 10 (de Pierrebourg 1999: 176), but the earliest standing hut is 5 years old (ibid. 178, Table 12)
X1027	1	1	1	1	1	23	4617	☐	>50	(I)	
X1028	1	1	1	1	1	36	1686	☐	>50	(I)	
X1029	1	1	1	1	1	24	5229	☐	<10	C	

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
X1030	2	2	2	2	2	56	3024	☐	>10	C	one of the two 'logis's accommodates two of the three conjugal couples (de Pierrebourg 1999: 49), and also functions as their primary cooking space
X1031	1	1	1	0	1	19	895	☐	3	C	there are no indoor cooking facilities in this residence
X1032	1	1	1	1	1	41	6400	☐	>20		de Pierrebourg's Figure 68 (de Pierrebourg 1999: 261) erroneously labels the cooking space as a 'logis'
X1033	1	1	1	1	1	42	2000	☐	>50	I	
X1035	1	1	1	1	1	38	1181	☐	>50	I	
X1036	2	2	2	1	1	41	1134	☐	>50	I	the residence was appropriated by the head after his brother abandoned it (de Pierrebourg 1999:60); one room interrupts the residence's fence and protrudes into the public pathway
X1037	1	0	1	1	1	58	12995	☐	>50	(I)	the residence has both a 'cuisine' and outdoor cooking facilities
X1039	1	0	1	1	1	27	1284	☐	>50	(I)	
X1040	3	2	3	1	1	71	3157	☐	>50		

Residence	Number of enclosed activity areas					Area in square meters		Multiple storeys	Age	Manner of acquisition	Comments
	Actual sleeping spaces	Conjugal rooms	Formal sleeping spaces	Cooking spaces	Eating spaces	Dwelling area	Ground-plan area				
X104N	2	2	2	1	1	53	2786	☐	40	C	a notional boundary divides this residence from X104S (de Pierrebourg 1999: 48); the residence incorporates a shop and a press
X104S	1	1	1	1	1	33	2002	☐	>10	I	the residence was part of a formerly larger residence which was notionally partitioned to create X104S and X104N (de Pierrebourg 1999: 48)
X118N	2	2	2	1	1	42	616	☐	>50	I	a notional boundary rather than a wall divides this residence from X118S (de Pierrebourg 1999: 48), possibly because a wall would block off X118S's access to a public pathway
X118S	2	2	2	2	2	57	727	☐	20	I	a notional boundary rather than a wall divides this residence from X118N (de Pierrebourg 1999: 48), possibly because a wall would block off the residents' access to a public pathway
X134N	2	2	2	1	1	36	1073	☐	>50	I	a notional boundary rather than a wall divides this residence from X134S (de Pierrebourg 1999: 48), possibly because a wall would block off X134S's access to a public pathway
X134S	2	2	2	1	1	52	1318	☐	25	I	a notional boundary rather than a wall divides this residence from X134N (de Pierrebourg 1999: 48), possibly because a wall would block off the residents' access to a public pathway
X138N	1	1	1	1	1	24	1810	☐	>20	I	a notional boundary divides this residence from X138S, although both are enclosed by a single wall (de Pierrebourg 1999: 48)
X138S	2	1	2	1	2	56	2905	☐	14	I	a notional boundary divides this residence from X138N (de Pierrebourg 1999: 48); the family of the head's brother does not use any of the residence's cooking facilities (ibid. 51)

APPENDIX D
Supplementary information about the residences from each of the sampled communities: sample size and classification of residence characteristics

---

This appendix provides supplementary information about the residences in the 14 settlements. Its aim is to clarify the entries in the Residence Table in Appendix C by considering the following:

a) The statistical robustness of the sample of residences taken from each community, i.e. how representative they are of the settlement's domestic architecture, and how representative their occupants are of the community as a whole. This covers the size of the residential sample, whether or not it was selected randomly, and the proportion of the local housing stock that it comprises.

b) An explanation of the way room counts and areal measurements were calculated from the original ethnographic reports (using the labels for room functions from the original reports). Wherever the function of a room was ambiguous in the original source, any assumptions made in the Residence Table are spelled out. Any potential inaccuracies in the areal measurements due to the scale or precision of the plans from which the measurements were derived are also noted, and blank entries in the Residence Table are accounted for.

Aliabad (Kramer 1982)

There were 67 standing residences in Aliabad in 1975, all of which were occupied. Although there was minimal information available on three residences (A103a, A1011 and A1075), 100% of Aliabad's housing stock is used in this study. The sample is statistically robust and fully representative of the settlement's domestic architecture and inhabitants.

1. *Actual sleeping spaces*: sleeping generally occurs around the hearth in 'living rooms' (ibid. 104, 117); in residences where no separate 'living room' exists, the residents sleep in multifunctional 'living room/kitchens' (ibid. 119); in specific cases, architecturally-defined 'kitchens' (which contain ovens rather than hearths) are also used for sleeping (ibid. 119). These rooms are listed in the columns labelled 'living rooms' and 'kitchens' in Kramer's Table 4.1 (ibid. 114). In some residences, however, it is not possible to differentiate between 'living rooms' that are used for sleeping and those that are surplus to the current inhabitants' sleeping requirements and are instead used for light storage or to accommodate guests (ibid. 119); when there is uncertainty surrounding the number of sleeping spaces in use, brackets are used to draw attention to this. In very warm weather, residents may instead sleep in foyers, on second storey balconies or platforms in courtyards (ibid. 109), but these spaces are not fully enclosed and are therefore not counted here.
2. *Conjugal rooms*: this count consists of all 'living rooms', 'living room/kitchens', and 'kitchens' that are known to currently accommodate one or more resident conjugal couples.
3. *Formal sleeping spaces*: all 'living rooms' and 'living room/kitchens' are counted, regardless of whether they are surplus to the inhabitants' sleeping requirements, but 'kitchens' are not counted here even when they are slept in, since they are only used expediently for that purpose. The relevant rooms are listed in Kramer's Table 4.1 (ibid. 114).
4. *Cooking spaces*: residents cook their meals using dung-fuelled ovens set into the floors of 'kitchens' (ibid. 99). Some residences possess more than one 'kitchen', but not all such rooms are actually used for cooking; some instead serve functions such as storage or housing for poultry (ibid. 129), whilst others are used only for bread-making (e.g. in A1083, ibid. 118, fig. 4.18). Kramer observes that residents limit their cooking operations to a single oven in order to conserve fuel, and that 'coresiding wives tend to operate as a single food-preparing unit' (ibid. 120). For the purpose of the present study, therefore, only one 'cooking space' is counted per residence, regardless of the number of 'kitchens' recorded in Kramer's Table 4.1 (ibid. 114). If there is only one 'kitchen' in a residence but some residents use it for sleeping, it is regarded as having a dual sleeping/cooking function and is included in the count (ibid. 119). Tea-brewing may occur on portable

braziers placed in ‘living rooms’ (ibid. 104), but since this is not a primary cooking activity, such spaces are not counted here. Cooking and other food processing activities also take place in the courtyard (ibid. 109), but as courtyards are not enclosed they are not counted here.

5. *Eating spaces*: residents eat meals in ‘living rooms’ (ibid. 102), or in multifunctional ‘living room/kitchens’ within residences where no specialised living room exists. These are listed in Kramer’s Table 4.1 (Table 114). It is not clear whether every available ‘living room’ is used on an everyday basis for eating in residences where several such rooms exist; when there is uncertainty surrounding the number of eating spaces in use, brackets are used to draw attention to this. On warm days, residents may instead eat in ‘foyers’ (ibid. 105), but these spaces are not fully enclosed and are therefore not counted here.
6. *Dwelling area*: this measurement represents the combined area of all enclosed spaces used on an everyday basis by the residents for sleeping, cooking, eating and congregating: it includes every ‘actual sleeping space’, ‘cooking space’ and ‘eating space’, as defined above. Since it is not possible to measure these spaces from the settlement plan, values are instead taken from Kramer’s Table 4.1 (ibid. 114). Unfortunately, Kramer includes wall thickness and the areas of all architecturally-defined ‘living rooms’ and ‘kitchens’ in her measurements, even when some of those rooms are defunct. In cases where her measurements are thought to include defunct ‘living rooms’ and ‘kitchens’, no entries were made.
7. *Ground-plan area*: this measurement represents the area of all ground-floor spaces within the compound wall, including internal and external walls. The measurements are derived from the column labelled ‘Compound area’ in Kramer’s Table 4.1 (ibid. 114).
8. *Multiple storeys*: upper storeys are taken into account, but underground stables, which contain no habitable spaces, are not counted here.
9. *Residence age*: this data is derived from the information provided in Kramer’s Figure 4.20 (ibid. 144).
10. *Manner of acquisition*: the ethnographer discusses the recent history of ownership of several of the residences (ibid. 146, 121). For the remaining residences – where no specific information is provided – if a co-residential group head co-resides with his siblings then it is probable that his residence was inherited from his father. If the head’s parents are depicted in Kramer’s kinship chart as deceased inhabitants of Aliabad (ibid. 22), then his residence was possibly inherited, but brackets are used to highlight the uncertainty. If a residence is known not to have been inherited and its age suggests that it could plausibly have been built during the adult life of its head, it is regarded as having been constructed by its current occupants, but brackets are again used to highlight the uncertainty. No entries were made for the remaining residences.

Baghestan (Horne 1994)

There were 29 occupied residences in Baghestan in 1976, as well as one abandoned residence (labelled '30' by the ethnographer) which is omitted from this study. In addition, there were several self-contained sets of rooms that did not form parts of occupied residences but were instead used as storerooms or stables by co-residential groups residing elsewhere in the settlement; these are regarded as extra-residential annexes rather than independent residences. The sample used here comprises every occupied residence in the settlement, and consists of 97% of Baghestan's housing stock. The sample is statistically robust, highly representative of the community's domestic architecture, and fully representative of its population.

1. *Actual sleeping spaces*: all co-residential group members sleep on bedding placed on the floor of their 'living room' (Horner 1994: 159). Most of these spaces are labelled as 'L' in Horne's Figures A1-9 (ibid. 200-208); another three second-storey 'living rooms' are noted in the text (ibid. 100, 216). For much of the summer, residents may sleep on roofs and in courtyards provided with mud platforms (ibid. 100), but since these spaces are not fully enclosed and are only used seasonally, they are not counted here.
2. *Conjugal rooms*: this category consists only of 'living rooms' that are known to currently accommodate one or more resident conjugal couples.
3. *Formal sleeping spaces*: all 'living rooms' are counted (ibid. 180). The only 'guest room' in the settlement did not exist during Horne's main period of fieldwork (it was built in the summer of 1976), and so is not counted here (ibid. 160).
4. *Cooking spaces*: residents cook their meals in circular coal-fired hearths (ibid. 143), some of which are located in the 'living rooms' and 'storeroom-kitchens' of their residences (ibid. 90). Rooms containing hearths are illustrated in Horne's Figures A1-9 (ibid. 200-208), but only those within residences – not annexes – are counted. Hearths in courtyards are often also used for cooking, bread-making and milk processing (ibid. 145), but as courtyards are not roofed they are not counted here. Notably, some residents possess no indoor cooking facilities at all, while others only have indoor hearths in annexes located in other parts of the settlement.
5. *Eating spaces*: everyday meals are consumed in 'living rooms' (ibid. 90). Those on the ground floor of residences are labelled as 'L' in Horne's Figures A1-9 (ibid. 200-208); those on second storeys are listed in the text (ibid. 216).
6. *Dwelling area*: this measurement represents the combined area of all enclosed spaces within the residence boundary that are used on an everyday basis by the residents for sleeping, cooking, eating and congregating: it includes every 'actual sleeping space', 'cooking space' and 'eating space', as defined above. The measurements exclude wall thickness and are derived partly from Horne's Figures A1-9 (ibid. 200-208), or, wherever possible, from the entries for 'living room area' in Horne's Table 11 (ibid. 153).

7. *Ground-plan area*: this measurement represents the area of all ground-floor spaces that become accessible once the forecourt of a residence has been entered, and includes all internal and external walls. The areas have not been taken from Horne's Table 11 (ibid. 153) because those measurements ignore wall thickness and take into account rooms owned by the residents that lie outside the boundary of each residence. Instead, measurements are derived from Horne's settlement plan (ibid. 122, Figure 17). When compared with the detailed plans in Figures A1-9 (ibid. 200-208), the settlement plan was found to be slightly inaccurate; in order to avoid creating a false sense of accuracy, each residence area has therefore been rounded down to the nearest $10m^2$.
8. *Multiple storeys*: very few residences have upper storey rooms (ibid. 216, footnote 13).
9. *Residence age*: since precise ages of rooms were not supplied, residences were categorised according to whether their original 'living room' was built more than twenty years ago, or less than twenty years ago. 'Living room' age was considered to be an appropriate determinant of residence age because they are the first rooms to be built in a new residence (ibid. 148), and rooms with other functions are not likely to be subsequently converted into 'living rooms' (ibid. 181). The relevant information is derived from Horne's Figure 17 (ibid. 122), while Horne's Figure 28 (ibid. 181) identifies all rooms originally built or used as 'living rooms'.
10. *Manner of acquisition*: although it is probable that residences that are less than twenty years old were constructed by their current occupants rather than having been inherited, Horne provides no data on this matter, and so no entries were made.

Capileira (Delaigue 1986)

There were 386 residences in Capileira in 1981, only 194 of which were occupied on a permanent basis (ibid. 43), and only 12 of which have sufficient social (ibid. 111) and architectural (ibid. 349ff.) information recorded to merit inclusion in this study. The residences in the sample are derived from every part of the settlement, but include examples of only four of the six traditional architectural forms described by Delaigue; in addition, none of the settlement's 30 modern-style residences are included (ibid. 65). The selected residences are inhabited by co-residential groups from all of Delaigue's economic categories (ibid. 111, Figure 13) with the exception of co-residential groups that are exclusively dependent on agriculture. Thus the sample, consisting of 3% of Capileira's private housing stock, is neither statistically robust nor statistically representative of the settlement's domestic architecture, though the occupants of the residences are mostly typical (demographically and economically) of the Capileiran population.

1. *Actual sleeping spaces*: inhabitants ordinarily sleep in single or double beds situated in special-purpose bedrooms (ibid. 87f.). Each bedroom is labelled on Delaigue's residence

plans as a *dormitorio* (ibid. 349-366). In several cases, the ethnographer records that a *dormitorio* is either unused or is used for light storage rather than sleeping (ibid. 180); in other instances the composition of the co-residential group itself suggests that available bedrooms are surplus to the occupants' sleeping requirements. When there is uncertainty surrounding the number of sleeping spaces in use, brackets are used to draw attention to this. In the past, if there were many children and not enough bedrooms, the eldest would sleep in a room used for grain storage (ibid. 180), but no cases of this were recorded at the time when the study was carried out.

2. *Conjugal rooms*: spouses ordinarily share a double bed in an independently located special-purpose room referred to as a 'chambre de parents' by the ethnographer (ibid. 88). Every *dormitorio* (ibid. 349-366) that is known to currently accommodate a resident conjugal couple is included in this count.
3. *Formal sleeping spaces*: any space identified as a *dormitorio* in Delaigue's residence plans (ibid. 349-366) is counted, even if it is a spare room.
4. *Cooking spaces*: residents cook food on gas stoves in rooms known as *cocina* (ibid. 86). They are labelled as such in Delaigue's residence plans (ibid. 349-366). Small, auxiliary *cocina* situated on third-storey extensions are only used occasionally for messier types of food preparation (ibid. 87) and for food storage (ibid. 92): since primary cooking activities do not occur there, these rooms are not counted. Rooms referred to as *cocina para anchura*, which are owned or rented by the co-residential group but are not located within the residence, are also not counted here.
5. *Eating spaces*: residents eat everyday meals sitting around a circular table in rooms known as *cocina* (ibid. 85). These are labelled as such in Delaigue's residence plans (ibid. 349-366). Not all *cocina* are counted, however: *cocina para anchura*, located in annexes, and small, auxiliary *cocina* located in third-storey extensions which contain tables used as surfaces for butchering and preparing food rather than for eating (ibid. 87), are not included in the count. Some residences have dining rooms (*comedor*), but since these are not used on an everyday basis they are not counted here.
6. *Dwelling area*: this measurement represents the combined area of all enclosed spaces used on an everyday basis by the residents for sleeping, cooking, eating and congregating: it includes every 'actual sleeping space' 'cooking space' and 'eating space', as defined above, together with every *estar* (living room) in regular use. The latter are labelled as such in Delaigue's residence plans (ibid. 349-366). The measurements are derived from those plans, and exclude wall thickness.
7. *Ground-plan area*: in the case of a multiple-storey residence, this measurement represents the area of all spaces cut into the hill slope which become accessible once the front door of the residence has been entered, regardless of whether the spaces belong to the lower or the upper storey. It includes internal and external walls where these exist

(some rooms are instead bounded by a cut rock-face). In the two cases where the rooms of the lower storey have not been planned (C1033, C1041), the upper storey – which extends over those rooms and cuts into the slope to create a few more rooms – was measured instead. In the two cases where self-contained flats were located on an upper storey and had their entrances at the upper storey level only (C1045, C1057), all inter-accessible upper storey spaces were measured. The measurements are derived from Delaigue's residence plans (ibid. 349-366).

8. *Multiple storeys*: residences with multiple storeys sometimes have an entrance on the ground floor and another on an upper storey (e.g. C1032, C1033). In cases where a self-contained flat is located on an upper storey, has no intercommunication with a lower storey, and can only be entered at the upper level (e.g. C1045, C1057), the residence is not regarded as having multiple storeys.
9. *Residence age*: all residences in the sample are known to have existed in some form since the early 20th century, but no dates of original construction have been recorded.
10. *Manner of acquisition*: Delaigue's discussion of residence acquisition gives partial information about residences that have been purchased or rented, and rooms that have been inherited (ibid. 115ff.). The data on each type of transaction has been aggregated, however, so that the particular residences that have undergone sale, are under leasehold, or have been transmitted to heirs can only be identified in cases where additional information on residence form, location, and degree of renovation has been supplied. As a consequence, entries could not be made for many of the residences.

Denpasar (Lancret 1997)

Only 13 of the residences recorded by Lancret in 1992 have sufficient information on room use and co-residential group structure (ibid. 267, Appendix 3) to merit inclusion in this study. These residences should be understood to represent an extremely small proportion of Denpasar's housing stock, accommodating a mere 0.05% of the community. The sample includes newly constructed as well as older renovated residences, and incorporates residences from the centre of the settlement as well as the suburbs, but excludes social housing (ibid. 126ff.). Since the residences are so few and were singled out for publication because of their ability to illustrate specific ethnographic observations, the sample is neither statistically robust nor statistically representative of Denpasar's housing or population.

1. *Actual sleeping spaces*: inhabitants ordinarily sleep in beds within special-purpose rooms (*kamar tidur*) (ibid. 229). In specific cases, a family priest or other residents (usually those who are very young, very old or newlyweds) sleep in enclosed pavilions which function as tabernacles, called *meten* (ibid. 223). Servants tend to sleep in small rooms such as storerooms or stairwells (ibid. 202). Some *kamar tidur* are attributed to particular

residents on Lancret's labelled residence plans (ibid. 143, 146-9, 221, 224-5), while others can be identified from scattered references in the publication text (ibid. 196, 201, 207, 226, 246, 252, 254). During the day, residents may instead sleep on an unroofed terrace or the platform of a partly exposed pavilion (ibid. 230), but since these spaces are not fully enclosed they are not counted here.

2. *Conjugal rooms*: on the basis of the few residence plans where sleeping spaces are attributed to the residents who use them (ibid. 143, 146-9), it is clear that individuals rarely share a bedroom with their spouse, and that, when they do, they usually occupy separate beds. For this reason, only those bedrooms indicated on the plans as definitely accommodating one or more resident conjugal couples are included in this count; no assumptions are made about the sleeping arrangements of other married couples.
3. *Formal sleeping spaces*: all *kamar tidur* are counted, including those indicated in Lancret's labelled residence plans as spare rooms or rooms reserved for guests (ibid. 143, 146-9, 221, 224-5). However, any room which functions primarily as a tabernacle, shop storeroom or stairwell is not counted here even when it is slept in, since it is only used expediently for that purpose.
4. *Cooking spaces*: food is cooked on gas stoves in enclosed special-purpose rooms which are either free-standing or form part of a multi-roomed structure, and are referred to as 'cuisines' by Lancret (ibid. 226f.). Some of these are labelled as such on individual residence plans (ibid. 143, 146-9); others are indicated in Lancret's Figure 56 (ibid. 247); the rest are mentioned in scattered references in the text (ibid. 196, 207, 252, 254). Food is also prepared in the restaurants, bakeries and snack-bars situated within some of the residences; several of these spaces can be identified from the diagrams (ibid. 147, 148) or the text (ibid. 202, 203, 254), but since none are used for domestic cooking operations, they are not counted here.
5. *Eating spaces*: exceptionally, residences may be equipped with a special-purpose enclosed room where residents eat their everyday meals, referred to as a 'salle à manger' by Lancret; occurrences of such rooms are mentioned in the text (ibid. 251, 252). Most meals, however, are eaten in partly exposed pavilions (*bale*) or terraces (ibid. 207, 218); since neither of these types of multifunctional space is fully enclosed, they are not counted here.
6. *Dwelling area*: this measurement represents the combined area of all enclosed spaces used on an everyday basis by the residents for sleeping, domestic (not commercial) cooking, eating and congregating: it includes every 'actual sleeping space', 'cooking space' and 'eating space', as defined above, as well as every enclosed room referred to as a 'salon' by Lancret. The measurements are derived from Lancret's residence plans (ibid. 143, 146-9, 188-9, 192) or, wherever possible, from her detailed room plans (ibid. 220-1, 224-5), and exclude wall thickness.

7. *Ground-plan area*: this measurement represents the area of all the ground-floor spaces located within the enclosure wall of a residence, and includes wall thickness. In several cases, the area encompasses one or more spaces used for commercial purposes. Most measurements are derived from the table of areas in Lancret's Appendix 4 (ibid. 168). The area given for D1017 was amended to exclude the inaccessible rooms situated along the residence facade.
8. *Multiple storeys*: the ideological significance attributed by the Balinese to vertically related spaces is responsible for the dearth of upper storeys and absence of apartment housing in the sample (ibid. 252). Nevertheless, some upper storeys have been constructed in densely built-up regions of the settlement (ibid. 196). In such cases, rooms situated below the upper storey can only be used as commercial spaces or as bedrooms for lodgers (ibid. 108). Residences with one or more upper storeys are indicated as such in Lancret's residence plans (ibid. 188-9, 192).
9. *Residence age*: all modified traditional residences (of the *umah* type) in the sample, apart from D1012, are known to have existed in some form since the first half of the 20th century. Dates of construction are only mentioned for a few of the modern residences (ibid. 150, footnote 19).
10. *Manner of acquisition*: there are scattered references in the text regarding the construction of residences by their current occupants (ibid. 252, 254); in addition, unless otherwise stated, a residence occupied by the head and his siblings is assumed to have been inherited from the head's parents. The manner in which the remaining residences were acquired has not been recorded.

Hasanabad (Watson 1979)

There were 36 residences in the settlement in 1960, one of which is omitted from the present study because it is unoccupied and partly in ruins. Very little information was available for two residences abandoned during the year of fieldwork (H1040, H1043), and another which is not identified on the settlement plan (H1041). The 35 residences making up this sample represent 97% of the settlement's housing stock. The sample is highly representative of its domestic architecture, and fully representative of Hasanabad's population.

1. *Actual sleeping spaces*: residents sleep on bedding spread on the floor around the hearths of 'living rooms' (ibid. 204). These rooms are labelled as 'A' on Watson's settlement plan (ibid. 35). Some residences have more than one 'living room' (ibid. 153, Table 5.2): in cases where there are two, the second is used as a parlour for entertaining and is not counted here (ibid. 126, 292), but where there are three, the third is rented out as a multifunctional 'living room' to a gendarme and his family (ibid. 292) and is therefore also included in the count.

2. *Conjugal rooms*: this count consists of all 'living rooms' that are known to currently accommodate one or more resident conjugal couples.
3. *Formal sleeping spaces*: all 'living rooms', including those that are surplus to the inhabitants' sleeping requirements and are instead put to use as parlours, are counted. These rooms are labelled with an 'A' on Watson's settlement plan (ibid. 35). Spaces labelled on Watson's individual residence plans as 'utility rooms' (ibid. 131, 132, 138, 143) appear to be former 'living rooms' that are currently employed for light storage: these are here regarded as spare sleeping spaces and are also included in the count.
4. *Cooking spaces*: residents cook food in dung-fuelled hearths located in the centre of 'living rooms' (ibid. 122). Such rooms are labelled with an 'A' on Watson's settlement plan (ibid. 34). When a residence possesses more than one 'living room', any that are not used on an everyday basis are not counted here, but any room used by lodgers is counted. Some of Watson's individual room plans (ibid. 134, 136, 141) suggest that tea brewing can takes place in enclosed *aywan* (entrance chambers) with hearths; such rooms are regarded as secondary cooking spaces and are not counted here. In the summer, cooking may instead take place on outdoor hearths in the courtyard (ibid. 159) or in 'utility rooms' (ibid. 132), but as these are seasonal alternatives they are not counted here.
5. *Eating spaces*: everyday meals are normally eaten around the hearth area of 'living rooms' (ibid. 208). Such rooms are identified with an 'A' on Watson's settlement plan (ibid. 35), but those that function as parlours are not used on an everyday basis and so are not counted here.
6. *Dwelling area*: this measurement represents the combined area of all enclosed spaces used on an everyday basis by the residents for sleeping, cooking, eating and congregating: this includes every 'actual sleeping space', 'cooking space' and 'eating space', as defined above, as well as every *aywan* (entrance chamber) in which everyday secondary cooking activities take place. The measurements exclude wall thickness, and are derived, whenever possible, from Watson's plans of individual rooms (ibid. 131, 134-7, 140-1, 144, 146, 148-150); otherwise, they are derived from the plans of individual residences (ibid. 129, 132, 138, 143, 145, 147). Watson's settlement plan (ibid. 35) was judged to be too inaccurate as a source for the remaining areas.
7. *Ground-plan area*: this measurement represents the area of all the ground-floor spaces that become accessible once the front door or courtyard gate of a residence has been entered, and includes internal and external walls. The measurements are derived from Watson's settlement plan (ibid. 35). Comparison of the settlement plan with the few detailed residence plans (ibid. 129-150) reveals that the former is not very accurate; to avoid creating a false sense of accuracy, the measurements have been rounded to the nearest $10m^2$.

8. *Multiple storeys*: upper storeys, known as *balaxaneh* (ibid. 126), are taken into account; underground stables, which contain no habitable spaces, are not counted.
9. *Residence age*: although Watson collected oral statements on the dates of construction for 28 of the residences in Hasanabad (ibid. 161), none of this information is published.
10. *Manner of acquisition*: no information about the ownership of residences and the manner in which they were acquired has been recorded.

Ibadan (Schwerdtfeger 1982)

Schwerdtfeger's 1969 study of Ibadan focuses only on semi-traditional residences located within the region defined by the old settlement wall. His own sample consists of 63 residences that were systematically selected from an area spanning 2,240ha in the walled region of the city (ibid. 3). Architecturally, the selected residences are all examples of the most prevalent form in the settlement. The inhabitants of the selected residences constitute 0.2% of the settlement's total population (ibid. xxxvii); in terms of ethnicity and religion the sampled population is typical of the community as a whole (ibid. 121, 302), but since this part of the settlement attracts a disproportionately small number of immigrants (ibid. 120), the sampled population's age distribution does not reflect the prevalence of the 20-29 age category in the community. Only ten of those 63 residences are included in the present study, as they were the only planned residences in Schwerdtfeger's publication whose room uses were indicated and whose occupants were enumerated. Since these residences were singled out for publication because of their ability to illustrate ethnographic observations, and all are of the semi-traditional type, they should be understood to represent a small and biased sample of Ibadan's housing stock, accommodating only 0.02% of Ibadan's population.

1. *Actual sleeping spaces*: residents sleep on beds or on the floor of 'living/sleeping rooms' (ibid. 131). Such rooms are identified on Schwerdtfeger's individual residence plans by the representation of beds or bedding within them (ibid. 126, 127, 128, 142, 146, 304, 306, 308, 408, 409). In the published plans, each 'living/sleeping room' is assigned a number which is also referred to on a chart showing the kinship relations between co-residential group members (ibid. 126, 127, 128, 145, 149, 305, 307, 308, 404, 406): in this way it is possible to tell which occupants sleep in which rooms. Overnight guests may instead sleep in the residence's 'central hall' (ibid. 125), but these spaces are not included in the count unless they are also regularly used for sleeping by residents.
2. *Conjugal rooms*: the count consists of all 'living/sleeping rooms' that are known to currently accommodate one or more resident conjugal couples. It is possible to identify these rooms from Schwerdtfeger's residence plans (ibid. 126, 127, 128, 142, 146, 304, 306, 308, 408, 409) because each 'living/sleeping room' is attributed to its occupants on the kinship chart of the co-residential group (ibid.126, 127, 128, 145, 149, 305, 307, 308,

404, 406). It is clear from this data that individuals rarely share a sleeping room with their spouse.

3. *Formal sleeping spaces*: all 'living/sleeping rooms' and rooms that fall under Schwerdtfeger's category of 'temporarily empty living and/or sleeping rooms' (ibid. 131, 286) are counted. Such rooms can be identified from Schwerdtfeger's residence plans (ibid. 126, 127, 128, 142, 146, 304, 306, 308, 408, 409).
4. *Cooking spaces*: residents cook their food in 'kitchens', which either consist of an enclosed room in the back yard of the residence (ibid. 125), or may instead be an architecturally undefined space around a hearth in the enclosed 'central hall' of the residence (ibid. 169) or in a covered veranda or portico in front of the 'living/sleeping rooms' (ibid. 124). 'Kitchens' are normally labelled as such in Schwerdtfeger's residence plans (ibid. 127, 128, 142, 146, 308, 408, 409); others are indicated only by hearths labelled on the plans as 'F.P.' (ibid. 126, 304, 306) or are described in the text. Only those spaces that are fully enclosed are counted here.
5. *Eating spaces*: Schwerdtfeger makes no mention of where meals are normally consumed, nor is a space for this purpose indicated in the residence plans. Due to insufficient data for this category of information, no count has been attempted.
6. *Dwelling area*: this measurement represents the combined area of all enclosed spaces used on an everyday basis by the residents for sleeping, cooking, eating and congregating: it includes every 'actual sleeping space' and 'cooking space', as defined above, as well as all enclosed 'central halls' (which are used for working and sitting – ibid. 125), and rooms furnished with chairs (which are here assumed to be communal everyday sitting rooms). The measurements exclude wall thickness, and are derived from Schwerdtfeger's plans of individual residences (ibid. 126, 127, 128, 142, 146, 304, 306, 308, 408, 409). Schwerdtfeger has not recorded whether daily meals are eaten in 'reception' rooms or hallways, but if this is the case then this measurement underestimates the amount of dwelling area that a residence possesses.
7. *Ground-plan area*: this measurement represents the area of all the ground-floor spaces that become accessible once the front door of the residence has been entered, and includes internal and external walls, the plinth or pavement along the residence's façade, as well as internally-accessible backyards bounded by the walls of neighbouring buildings. The measurements are derived from Schwerdtfeger's individual residence plans (ibid. 126, 127, 128, 142, 146, 304, 306, 308, 408, 409).
8. *Multiple storeys*: upper storeys are rare in this type of semi-traditional residence (ibid. 125), and staircases instead tend to lead to the roof.
9. *Residence age*: Schwerdtfeger reports several residential histories given by co-residential group heads; these often include the year in which construction was begun (ibid. 143, 303, 404, 406).

10. *Manner of acquisition*: Schwerdtfeger discusses the recent history of most residences, and usually mentions whether they were built by their current occupants or inherited. In one case, where specific information is not provided but the residence appears quite old, the current head is assumed to have inherited usufructory rights over the property, but brackets are used to highlight the uncertainty.

Kireyka (Tobert 1988)

There were 28 occupied residences in Kireyka at the end of 1984 (ibid. 109, Table 3), and a further nine residences that were recently abandoned but still standing which have been excluded from the present study (labelled '7', '11', '21', '34', '36', '40', '41', '42', '43' in Tobert 1988). One recently-abandoned compound ('33' in Tobert 1988), which was partly reused as an animal enclosure by a neighbour, is here regarded as a non-residential annex rather than an independent residence; several free-standing huts without compound walls, some of which are in ruins, are also not regarded as residences. The sample used here comprises every occupied residence in the settlement, and consists of approximately 76% of Kireyka's housing stock. The sample is statistically robust, representative of the settlement's domestic architecture, and fully representative of Kireyka's population.

1. *Actual sleeping spaces*: residents usually sleep on various types of bed or bedding set on the floors of huts (ibid. 187). These huts are labelled as 'cooking/sleeping houses', 'sleeping houses' and 'men's houses' in Tobert's Table 16 (ibid. 172). Note that 'men's houses' are classified together with 'guest houses' in that table, but various clues in the text can help distinguish between the two types of hut (ibid. 158, 162, 170, 171, 174). There is one instance (in K1005) where a 'guest house' is used on a regular basis by a resident, and this is included in the count. When it is not too cold or rainy, residents also sleep on straw mats in unroofed parts of the residence (ibid. 187), but since these are not enclosed they are not counted here.
2. *Conjugal rooms*: these include all 'bridal houses' (ibid. 174), as well as any 'cooking/sleeping houses' in residences where the head's husband does not have use of a personal 'men's house' (note that the 'men's house' in K1046 is not used by the head's husband but by her son – ibid. 162). The former are listed as 'sleeping houses' in Tobert's Table 16 (ibid. 172). The latter can be identified from the complete list of huts given in the same table (ibid.).
3. *Formal sleeping spaces*: the count includes all 'houses' of the 'cooking/sleeping', 'sleeping' and 'men or guest' types, that are used for sleeping by residents or visitors. These are listed in Tobert's Table 16 (ibid. 172).
4. *Cooking spaces*: residents cook their food on hearths located in 'cooking/sleeping houses'. These are listed in Tobert's Table 16 (ibid. 172). In addition, there are two

specialised 'cooking houses' in the settlement, only one of which is in use (ibid. 173). After dark, outdoor hearths may also be employed (ibid. 156), but since these spaces are not enclosed they are not counted here.

5. *Eating spaces*: Tobert makes no mention of where meals are normally consumed, but only reports that this is never done in front of in-laws (ibid. 157). Due to insufficient data for this category of information, no count has been attempted.
6. *Dwelling area*: this measurement represents the combined area of all enclosed spaces used on an everyday basis by the residents for sleeping, cooking, eating and congregating: it includes every 'actual sleeping space' and 'cooking space', as defined above. The measurements are calculated from the 'mean house diameters' column in Tobert's Table 16 (ibid. 172). Measurements include wall thickness, though walls are so thin that they are likely to add very little to the overall area.
7. *Ground-plan area*: this measurement represents the area of all spaces that become accessible once the compound wall or thorn fence of a residence has been entered, and includes wall thickness. Areas are calculated from Tobert's settlement plan (ibid. 107, Figure 16) rather than from the 'mean compound diameter' listed in Tobert's Table 13 (ibid. 163), as the diameters would exaggerate the regularity of the residence shape and omit the outer thorn enclosures of some residences.
8. *Multiple storeys*: all huts have conical roofs and therefore cannot support upper storeys.
9. *Residence age*: the year of construction of most residences is given in Tobert's Appendix B, where the inhabitants' recent life history is summarised (ibid. 238-43). For several residences, only approximate dates relative to the inhabitants' life events are provided. In the four cases where a thorn fence enclosed two or more compounds, the residence age was calculated from the year in which the fence were erected.
10. *Manner of acquisition*: Tobert mentions cases where a residence was bought (ibid. 121) or appropriated without purchase (ibid. 238, 240). Unless otherwise stated, residences are assumed to have been constructed by their current occupants.

Marrakech (Schwerdtfeger 1982)

The 75 residences investigated by Schwerdtfeger were systematically selected from the walled part of Marrakech and from the squatter suburb of Sidi Youssef be Ali, which is located immediately outside the wall and inhabited mostly by immigrants (ibid. 222). The selected residences are typical of those two regions, but because few are of modern construction they do not reflect the domestic architecture of the settlement as a whole, and particularly those suburbs where modern-style housing is prevalent (ibid. 218); furthermore, the 75 residences under-represent the availability of electricity and piped water in the settlement. The inhabitants of these residences reflect the community's mixture of faiths, and ethnic and demographic composition. Only 11 of these residences were fully planned, had

their co-residential group composition recorded, and so were included in the present study. Since the residences are very few in number and were singled out for publication because of their ability to illustrate ethnographic observations, they should be understood to represent a small and biased sample of Marrakech's housing stock, accommodating a mere 0.04% of Marrakech's population.

1. *Actual sleeping spaces*: residents sleep in 'sleeping rooms' (ibid. 222). These can be identified on Schwerdtfeger's individual residence plans (ibid. 217, 234, 236, 238-9, 241, 294-5, 296, 297) by their furnishings and by the fact that each member of a co-residential group who is depicted on a kinship chart (ibid. 217, 234, 237, 238-9, 241, 295, 296, 297) is assigned a reference number that corresponds to the room in which he or she sleeps.
2. *Conjugal rooms*: the count consists of all 'sleeping rooms' that are known to currently accommodate one or more resident conjugal couples. It is possible to identify these rooms from Schwerdtfeger's residence plans (ibid. 217, 234, 236, 238-9, 241, 294-5, 296, 297) because each sleeping room is attributed to its occupants on the kinship chart of the co-residential group (ibid. 217, 234, 237, 238-9, 241, 295, 296, 297).
3. *Formal sleeping spaces*: 'sleeping rooms' and rooms that Schwerdtfeger describes as 'empty' (ibid. 222) are counted. Such rooms can be identified from the residence plans (ibid. 217, 234, 236, 238-9, 241, 294-5, 296, 297), which also indicate whether they are slept in by residents or are available as spares.
4. *Cooking spaces*: residents cook their food in 'kitchens' (ibid. 262), which are labelled as such on Schwerdtfeger's residence plans (ibid. 217, 234, 236, 238-9, 241, 294-5, 296, 297), or, in one case, described in the text (ibid. 240).
5. *Eating spaces*: Schwerdtfeger makes no mention of where meals are normally consumed, nor is a space for this purpose indicated by any distinctive furniture in the residence plans. Due to insufficient data for this category of information, no count has been attempted.
6. *Dwelling area*: this measurement represents the combined area of all enclosed spaces used on an everyday basis by the residents for sleeping, cooking, eating and congregating: it includes every 'actual sleeping space' and 'cooking space', as defined above. The measurements exclude wall thickness, and are derived from Schwerdtfeger's plans of individual residences (ibid. 217, 234, 236, 238-9, 241, 294-5, 296, 297). Schwerdtfeger has not recorded whether daily meals are eaten in 'reception' rooms, but if so then this measurement underestimates the amount of dwelling area that a residence possesses.
7. *Ground-plan area*: this measurement represents the area of all the ground-floor spaces that become accessible once the front door of the residence has been entered, including internal and external walls. In cases of upper storey flats, only the stairwell at ground

level and any ground floor rooms that can be accessed from it are measured. The measurements are derived from Schwerdtfeger's individual residence plans (ibid. 217, 234, 236, 238-9, 241, 294-5, 296, 297).

8. *Multiple storeys*: residences whose rooms extend over more than one storey are common in the tightly-packed walled sector of the settlement, since the addition of a storey is the only way to extend a residence's floor space (ibid. 199).
9. *Residence age*: most residences in the walled sector of the settlement have undergone several changes in ownership since their construction; the upshot is that few current occupants know their residence's age or early history (ibid. 261). The majority of residences in Schwerdtfeger's sample were built before 1920 (ibid.), but no more precise data is offered; only one of the residences in the present study is known to have been built more recently (ibid. 240).
10. *Manner of acquisition*: Schwerdtfeger discusses the recent history of seven residences, and mentions whether they were built by their current occupants, rented, bought or inherited. In cases where no information is offered in the text, no entries were made in the Residence Table.

Anegondi (Tobert 2000)

There were approximately 650 residences in Anegondi late 1989 (ibid. 9), excluding government-sponsored social housing for people belonging to Scheduled Castes (Untouchables). The 50 or so residences recorded by Tobert between 1987 and 1993 provide a cross-section of the settlement's private housing and inhabitants (ibid. viii.), and are drawn from every part of the settlement, none of which is inhabited by one social group or caste to the exclusion of all others (ibid. 2); however, they were not selected randomly, as the ethnographer had to rely on introductions and invitations by the occupants in order to document their residences (ibid. 60). The recorded inhabitants include members of the population from all levels of society, and every religion, caste and economic status in the community (ibid. 187f., Appendix 1). The sample used in this study comprises only 47 of those residences, as several of Tobert's records were too ambiguous to be included ('45', '50', '50d', '51'), and one of the recorded residences ('25') was already abandoned by late 1989. Thus, the present sample represents approximately 7% of Anegondi's occupied private housing stock, and, though not statistically representative, is large enough to be statistically robust.

1. *Actual sleeping spaces*: in larger residences, inhabitants sleep on wooden beds located in special purpose 'sleeping rooms'; they are labelled as such in Tobert's individual residence plans (ibid. 89-173), and so are easily identifiable. Most residences, however, lack such monofunctional rooms, and residents instead sleep on a mat placed on the floor

of an enclosed inner hall (ibid. 78). Inner halls are variously labelled in the plans as 'multipurpose', 'hall' or 'living room'. All these rooms, with the exception of vestibules and corridors (which are sometimes also labelled as 'halls' or 'hallways'), are included in the count. In specific cases a 'kitchen', 'prayer room', 'birth room', or enclosed vestibule takes on a role as sleeping accommodation in a particular residence, and is therefore also included in the count. Whenever a residence has 'sleeping rooms' as well as multifunctional inner halls, the count automatically incorporates both types of room even though it is not certain that all available rooms of those types are actually in use for sleeping: brackets are used to draw attention to the uncertainty. In warm weather, residents may instead sleep on verandas, roofs, or platforms facing the street (ibid. 78), but as these spaces are seasonal alternatives and are not enclosed they are not counted here.

2. *Conjugal rooms*: this count consists of any space that is known to currently accommodate one or more resident conjugal couples, whether it be a 'sleeping room', 'multipurpose' room, 'living room', inner 'hall', or 'kitchen'. In the absence of any evidence to the contrary, it is assumed that individuals normally share rooms with their spouses.
3. *Formal sleeping spaces*: in residences that possess monofunctional 'sleeping rooms', the count consists only of those rooms; in residences that do not possess such monofunctional spaces, the count consists of all spaces labelled in the plans as 'multipurpose', 'hall' or 'living room', but excludes any that are obviously just corridors or vestibules.
4. *Cooking spaces*: residents cook their vegetarian meals on hearths fuelled by wood or cow dung (ibid. 81), and use separate hearths to prepare meat (ibid. 78). The locations of hearths are indicated in Tobert's individual residence plans (ibid. 89-173); the spaces that contain them are labelled as 'kitchen' or 'multipurpose'. All such rooms are regarded as primary cooking spaces, regardless of whether they are used for vegetarian or meat cooking. Outdoor hearths may alternatively be used (ibid. 130), but as these spaces are not enclosed they are not counted here.
5. *Eating spaces*: residents normally consume everyday meals sitting on fibre mats in the room where cooking is performed (i.e. 'kitchens' or 'multipurpose' rooms with hearths), but if such a room is too small, an empty nearby room may be used instead (ibid. 78). The latter is usually labelled as a 'hall' or 'eating space' in Tobert's individual residence plans (ibid. 89-173). In grander residences, this arrangement is replaced by a table and chairs (ibid. 78), and the relevant rooms are labelled as 'eating rooms' or 'dining rooms'; since these are also used on an everyday basis, they are included in the count.
6. *Dwelling area*: this measurement represents the combined area of all enclosed spaces used on an everyday basis by the residents for sleeping, cooking, eating and congregating: it includes every 'actual sleeping space', 'cooking space' and 'eating

space', as defined above, together with any 'living room' and any 'hall' that is not just a vestibule or corridor. (Note, however, that in two-room or three-room buildings where spaces are laid out in a linear way, entrance vestibules function as living spaces and therefore contribute to the dwelling area.) The measurements are calculated from Tobert's individual residence plans (ibid. 89-173) and exclude wall thickness.

7. *Ground-plan area*: this measurement represents the area of all the ground-floor spaces that become accessible once the front door of a residence has been entered, and includes internal and external walls and sleeping platforms attached to the exterior of the front wall; any residential annex, cattle-shed or attached yard that is not accessible from within an individual residence and therefore does not constitute part of it, is excluded from the calculation. Tobert offers a total area for most of the residences she records, but these sometimes include annexes and exclude sleeping platforms, and so were deemed unsuitable. Instead, dimensions are measured from Tobert's individual residence plans (ibid. 89-173).
8. *Multiple storeys*: upper storeys are uncommon in Anegondi. It is more common for residences to have ladders resting on platforms on the ground and leading to the roof, but these are not regarded as multiple-storey structures.
9. *Residence age*: Tobert occasionally mentions the approximate year in which a residence was constructed (ibid. 90, 132, 136, 138, 146), but this information has not been provided for the majority of residences.
10. *Manner of acquisition*: information on the use-life of residences or the co-residential group's recent history is provided for several residences (ibid. 30, 90, 96, 100, 110, 122, 126, 132, 136, 138, 146, 148, 152, 154, 168). Since residences may be either bought, constructed on a freely acquired or inherited plot, or inherited by the owner's sons upon his death, no entries were made in cases where precise information was unavailable.

Pobia (Trova 1989)

There were 376 registered households in Pobia in 1986 (ibid. 11) suggesting a total of 376 occupied residences in the settlement. Trova selected 40 of those randomly from all over the settlement for analysis: they vary in terms of their form, building materials, and age, and include two holiday homes (ibid. 11). Apart from the basic structure of each co-residential group, very little social information could be derived from the original source concerning the inhabitants of these residences. Only one of the residences was excluded from the present study ('house 6', whose bedrooms were not ascribed any users). The sample of 39 residences is statistically representative and robust, comprising approximately 10% of Pobia's occupied residences but an unknown proportion of its total housing stock, as the number of unoccupied residences in the settlement is not recorded.

1. *Actual sleeping spaces*: residents sleep in beds in special-purpose bedrooms that are categorised as either 'parents' bedroom', 'children's bedroom' or 'grandparent's bedroom' (ibid. 17). These spaces are labelled on Trova's individual residence plans as 'Sp', 'Sc' and 'Sg' respectively (ibid. Appendix). In specific cases, a 'living room', 'kitchen', 'dining room' or 'parlour' is used by certain residents as a sleeping space and has also been counted: on Trova's residence plans, such rooms are labelled with both functions. During hot weather, yards may also be used for sleeping (ibid. 18), but since they are seasonal alternatives and are not fully enclosed, they are not counted here.
2. *Conjugal rooms*: all 'parents' bedrooms' – labelled as 'Sp' on Trova's individual residence plans (ibid. Appendix) – and any other sleeping room indicated in the text as accommodating a resident conjugal couple, are counted.
3. *Formal sleeping spaces*: all 'parents' bedrooms', 'children's bedrooms', 'grandparent's bedrooms' and 'spare bedrooms' are counted, as long as they do not double as 'living rooms', 'kitchens', 'dining rooms' or 'parlours'. The relevant rooms are labelled as 'Sp', 'Sc', 'Sg' and 'S' in Trova's individual residence plans (ibid. Appendix).
4. *Cooking spaces*: residents cook their meals on gas stoves in 'kitchens' or 'kitchen/living rooms' (ibid. 17). These are labelled as 'K' and 'K/L' in Trova's individual residence plans (ibid. Appendix).
5. *Eating spaces*: residents eat their everyday meals sitting around a table in the 'kitchen' or 'kitchen/living room' (ibid. 17). These are labelled as 'K' and 'K/L' in Trova's individual residence plans (ibid. Appendix). In some cases, a residence plan with illustrated furnishing will show the existence of a separate living room ('L') that also contains a table and chairs; when this occurs, both the 'kitchen' and 'living room' are included in the count even though it is not known whether daily meals are consumed in both, and brackets are used in the Residence Table to draw attention to this uncertainty. 'Parlours' and 'dining rooms' often also contain a table for eating, but these spaces are not counted here as they are only used on special occasions rather than on an everyday basis. Tables in 'children's bedrooms' are assumed to be used as work desks rather than eating surfaces and are not counted here. During hot weather, meals may alternatively be eaten in the yard (ibid. 18), but as yards are not enclosed they are not counted here.
6. *Dwelling area*: this measurement represents the combined area of all enclosed spaces used on an everyday basis by the residents for sleeping, cooking, eating and congregating: it includes every 'actual sleeping space', 'cooking space' and 'eating space', as defined above, together with any room labelled on the individual residence plans as a 'living room' (ibid. Appendix). The measurements are calculated from those plans and exclude wall thickness.
7. *Ground-plan area*: in the case of a multiple-storey residence, this measurement represents the area of all spaces cut into the hill slope which become accessible once the

front door of the residence has been entered, regardless of whether the spaces belong to the lower or the upper storey. It includes internal and external walls and internally-accessible fenced yards. In cases of self-contained flats located on upper storeys, only the stairwell at ground level and any ground floor rooms that can be accessed from it are measured. Measurements are taken from Trova's individual residence plans (ibid. Appendix). It should be noted that Trova provides scales for only five of her residence plans (P1005, P1013, P1021, P1026, P1035), but since all these scales are the same, it is assumed that the remaining residences were also planned at that scale.

8. *Multiple storeys*: residences possessing an upper storey that is reached by an internal and/or external staircase are regarded as having multiple storeys, but residences that have stairs that lead only to the roof are categorised as single-storey.
9. *Residence age*: the year in which each of the residences was originally constructed is recorded in a table in Trova's appendix (ibid.), and the years in which the residences were modified, extended or renovated are also noted in the text.
10. *Manner of acquisition*: no information is provided concerning the history of ownership of individual residences, which could theoretically have been bought, rented, inherited or constructed by their occupants. Due to insufficient data for this category of information, no entries were made.

Karapinar (Aurenche et al. 1997)

There were 21 residences in Karapinar in 1984, including R1021, a residence located 500m to the east of the settlement nucleus. Four of those (labelled 'M5', 'M7', 'Ensemble 8A', and 'M17' by the ethnographers) were unoccupied and have been excluded from this study. In addition, there were several self-contained rooms or sets of rooms that did not form parts of occupied residences but were instead used as storerooms or stables by co-residential groups residing elsewhere in the settlement (including 'M1, Bloc D', 'M12', 'M15', and the rooms to the north of 'M20'); these are regarded as extra-residential annexes rather than independent residences. The sample used here is made up of the 17 occupied residences in the settlement, and consists of 81% of Karapinar's housing stock. Though the sample is small, it is fairly representative of the settlement's domestic architecture, and fully representative of Karapinar's population.

1. *Actual sleeping spaces*: residents normally sleep on bedding placed on the floor of special-purpose or multifunctional rooms (ibid. 95) designated by Aurenche et al. as 'chambres à coucher' or dual-purpose 'pièces d'accueil et chambres à coucher' respectively. Every room that is used for sleeping by full-time or part-time residents is identified in the detailed residence descriptions provided in the text (ibid. 223-253).

2. *Conjugal rooms*: all ‘chambres à coucher’ and ‘pièces d’accueil et chambres à coucher’ that are known to currently accommodate one or more resident conjugal couples are counted. The occupants of such rooms are usually mentioned in the descriptions of the residences in the text (ibid. 223-253). In most cases there is only one such room in the residence, so married residents are assumed to sleep together with their spouses.
3. *Formal sleeping spaces*: this count includes not only the monofunctional and multifunctional rooms mentioned above, which residents use on a regular basis, but also all rooms reserved for the use of guests, or former sleeping spaces currently used for light storage. All such spaces are identified in the text (ibid. 223-253).
4. *Cooking spaces*: residents cook their food in rooms equipped with hearths. This may be a special-purpose room, referred to by Aurenche et al. as a ‘cuisine’, or a room that doubles as a ‘pièce d’accueil (ibid. 95) or a ‘pièce de réserve’ (ibid. 96). The relevant spaces are identified in the descriptions of the residences in the text (ibid. 223-253). Occasionally, bread is baked in a separate enclosed room (ibid. 233), but such rooms are here regarded as secondary cooking spaces and are therefore not counted. In addition, certain co-residential groups cook in ‘cuisines’ that are located in annex buildings separate to their residences: all such rooms are not counted here. In summer, cooking may instead be performed on outdoor hearths (ibid. 89), but since these spaces are not enclosed they are not counted here.
5. *Eating spaces*: everyday meals are consumed at floor-level in rooms referred to by Aurenche et al. as ‘pièces d’accueil’ (ibid. 95). These can be identified from the descriptions of the residences in the text (ibid. 223-253). Several of these rooms are specified as being reserved for the entertainment of guests: since they are intended for occasional rather than everyday use, they are not counted here. All remaining ‘pièces d’accueil’ are included in the count, even though it is not clear in instances where a residence has more than one such room whether every one of them is actually used for eating; in such cases, brackets are used in the Residence Table to draw attention to the uncertainty.
6 *Dwelling area*: this measurement represents the combined area of all enclosed spaces in the residence used on an everyday basis by the residents for sleeping, cooking, eating and congregating: it includes every ‘actual sleeping space’, ‘cooking space’ and ‘eating space’, as defined above. The measurements are derived from the catalogue of room areas in Aurenche et al.’s Table K2 (ibid. 259), and exclude wall thickness. No attempt was made to calculate room areas for residences that are not listed in that table, as the settlement plan is drawn at an unsuitable scale for measuring the dimensions of individual rooms. However, one additional dwelling area – for R1013 – is mentioned in the text (ibid. 244).

7 *Ground-plan area*: this measurement represents the area of all the ground-floor spaces that become accessible once the front door or courtyard gate of the residence has been entered, including internal and external walls; any annex that is not accessible from within an individual residence, and therefore does not constitute part of it, is excluded from the calculation. The measurements offered in the 'total occupied space' column of Aurenche et al.'s Table K.2 (ibid. 259) were deemed unsuitable, as they exclude walls and include areas of rooms located on upper storeys and in annexes. Instead, dimensions are measured from Aurenche et al.'s individual residence plans wherever possible (ibid. 222, 226, 232, 234, 236, 240, 250, 251); otherwise, measurements are taken from the settlement plan (ibid. 219, Figure K.2).

8 *Multiple storeys*: none of the residences in Karapinar are regarded as having multiple storeys. Occasionally there are steps leading up from ground level to the residence's entrance (e.g. in R1016, R118A and R118B), or a wooden ladder leading to a roof (Aurenche et al. 1997: 85), but there are no upper storeys.

9 *Residence age*: the approximate year when the construction of a residence was begun is only mentioned in six cases (ibid. 231, 237, 239, 248, 249, 251).

10 *Manner of acquisition*: Aurenche et al. discuss the history of acquisition and modification of several residences, and for 13 of them mention or imply whether they were built by their current occupants, bought, or inherited and then modified. In cases where no precise information is offered in the publication text, no entries were made.

Ban Touei (Clément-Charpetier and Clément 1990)

The plan of Ban Touei (ibid. 204, fig. 159) shows that there were 13 residences in late 1972. The plan also shows various other unlabelled pitched-roofed buildings scattered across the settlement, which are probably stores and animal shelters that have not been attributed to their owners (ibid. 205). One of the 13 residences is owned by an inhabitant of the neighbouring settlement and is rented out (ibid. 209), but because the composition of the co-residential group occupying it has not been recorded it could not be used here. The remaining 12 occupied residences have been used in this study, despite the very limited architectural information available on each of them. Thus the sample comprises 92% of Ban Touei's housing stock, and, though small, is highly representative of the settlement's domestic architecture and population.

1. *Actual sleeping spaces*: all members of the co-residential group sleep on mats (ibid. 239) that are placed on the floors of rooms known as *h00ng2 n00n*, in the enclosed part of the residence (ibid. 123). Unfortunately the plan of Ban Touei (ibid. 204, fig. 159) shows only the roofs of residences rather than their internal architectural divisions, so there is insufficient data to permit a count of these spaces.

2. *Conjugal rooms*: in the Vientiane region, spouses typically sleep next to each other in the middle of a room (ibid. 131), and if there is more than one conjugal couple in the co-residential group the residence is modified to create an additional room for the extra couple to sleep in (ibid. 143). However, it is not possible to confirm this generalisation in Ban Touei, since Clément-Charpetier and Clément's settlement plan does not indicate any internal architectural divisions (ibid. 204, fig. 159). A count of '0' was entered for the three cases where no conjugal couples are present in the residence, but otherwise no entries were made.
3. *Formal sleeping rooms*: since there is no information about the internal architectural divisions in each residence, it is not possible to count the number of 'formal sleeping spaces'.
4. *Cooking spaces*: residents cook their meals on wood-fired hearths located in rooms which Clément-Charpetier and Clément refer to as 'cuisines' (ibid. 243). Whilst these rooms are not labelled on the settlement plan (ibid. 204, fig. 159), the ethnographers' typology of Vientiane residences (ibid. 108) shows that there is always one architecturally distinct 'cuisine' per residence – situated either at the back end of the enclosed part of the building, or in an independently roofed room behind the main chamber – and there is usually an unroofed platform used for washing activities directly next to it (*sâan*). It is therefore possible to count one 'cooking space' for each residence, and infer its position within the building from Clément-Charpetier and Clément's settlement plan, either from the existence of a separate roof or the presence of an adjacent platform.
5. *Eating spaces*: residents normally consume everyday meals sitting on the floor around a low woven bamboo table (ibid. 233) set in rooms which Clément-Charpetier and Clément refer to as 'cuisines' (ibid. 243). According to the ethnographers' typology of Vientiane residences (ibid. 108), there is only one 'cuisine' per residence. When guests are present, meals are instead taken on the veranda (ibid. 132), but since these spaces are not fully enclosed they are not counted here.
6. *Dwelling area*: this measurement represents the combined area of all enclosed spaces used on an everyday basis by the residents for sleeping, cooking, eating and congregating: this includes the main part of the building and the associated 'cuisine'. Verandas, washing platforms and ladders are excluded. Whilst platforms and ladders are easily identifiable from the settlement plan (ibid. 204, fig. 159), the position and approximate size of the roofed veranda in each residence can only be inferred by classifying the roofing depicted in the plan according to the ethnographers' typology (ibid. 106-8). In order to avoid creating a false sense of accuracy for what is essentially an estimation, which – exceptionally – includes internal walls, each measurement has been rounded down to the nearest $5m^2$.

7. *Ground-plan area*: this measurement represents the area marked out by the wooden posts and associated ladders of a single residence on the ground surface. The dimensions of each residence are measured from the settlement plan (ibid. 204, fig. 159), but since the plan shows roofs rather than walls or posts, and roofs are known to extend a little beyond the edges of the building on all sides, the measurements have been rounded down to the nearest $10m^2$.
8. *Multiple storeys*: although the area beneath the suspended structure of the residence is used for storage (ibid. 39), for the purposes of the present study this is not regarded as a separate storey and none of the residences are categorised as having multiple storeys.
9. *Residence age*: only one residence age is reported in the text (ibid. 209). In addition to this, the ethnographers make the generalisation that wooden residences in Ban Touei with areas greater than $70m^2$ are older than smaller residences, some of which are provisional bamboo constructions (ibid. 151). Such large residences have been categorised as '>20' years old.
10. *Manner of acquisition*: in four cases, some information has been provided concerning either the use-life of a residence or the recent history of its occupants, which permits an inference about the way the residence was acquired (ibid. 209f.). For the residences where no data of this sort was available, no entries were made.

Willow Lake (Janes 1983)

There were seven occupied residences in Willow Lake in the spring of 1975, as well as one uninhabited state-owned cabin (ibid. 35) which has been omitted from this study. The sample used here comprises every occupied residence in the settlement, and consists of 100% of Willow Lake's private housing stock. The sample is fully representative of the community's domestic architecture and population.

1. *Actual sleeping spaces*: residents usually sleep on mattresses, sleeping bags and blankets placed on the cabin floor and removed during the day (ibid. 45). Some sleep on home-made single or double wooden bed frames fastened to the cabin wall, or, more rarely, on metal bed frames (ibid. 45ff., Figures 15-17, 19). Since all cabins consist of just one room, only one sleeping area is counted per residence. During the summer months, sleeping occasionally takes place in tipis (ibid. 59), but since these do not constitute part of the residence, they are not counted here.
2. *Conjugal rooms*: residences that are known to be currently occupied by one or more resident conjugal couples are categorised as having a conjugal room.
3. *Formal sleeping spaces*: since all residents sleep in a single, spatially undifferentiated room, there can be no more than one 'formal sleeping space' in each residence.

4. *Cooking spaces*: residents typically cook on the drum or airtight stove placed centrally in the southern portion of each cabin (ibid. 44). In the hotter months, food may instead be cooked on a stove located immediately outside the cabin (ibid.) or on the hearths of tipis (ibid. 60), but since none of these latter spaces lie within the residence they are not counted here.
5. *Eating spaces*: everyday meals are eaten around an oilcloth that is spread on the floor of the cabin at mealtimes and afterwards removed (ibid. 44). Since this space has no architectural definition, only one eating area is counted per residence. Some food consumption and tea- or coffee-drinking also occurs in tipis (ibid. 60), but since these are not part of the residence they are not counted here.
6. *Dwelling area*: this measurement represents the combined area of all enclosed spaces used on an everyday basis by the residents for sleeping, cooking, eating and congregating. This amounts to the internal area of each cabin. Where possible, the measurement is derived from Janes' Figures 15-19 (ibid. 45ff.) and rounded to the nearest square metre. Notably, 'dwelling area' is calculated differently by Janes (ibid. 102: Table 6), who includes the area of any associated tipis; tipis are excluded here, as they do not form parts of residences.
7. *Ground-plan area*: this measurement represents the ground-floor area of each cabin, and includes wall thickness; in the case of W1002, the measurement represents the area of the wall tent used temporarily as a residence. Areas are derived from the table of dimensions in Janes' Appendix C (ibid. 122), and are rounded to the nearest square metre.
8. *Multiple storeys*: none of the residences have upper storeys.
9. *Residence age*: four of the cabins were newly constructed in 1974/1975 using government funds; they replace older, smaller cabins whose functions have now changed to warehouses (ibid. 35). The histories of W1002 (ibid. 46) and W1003 (ibid. 26) are discussed in some detail, but no information is provided concerning W1007.
10. *Manner of acquisition*: all residences are known to have been constructed by their occupants, except in the case of W1007 where no information on the matter is provided.

Xculoc (de Pierrebourg 1999)

There were 41 occupied residences in Xculoc in 1988. This count includes residences that were not equipped with complete perimeter fences but were nevertheless regarded as independent domiciles by members of the community (ibid. 47). In addition, the settlement contained a fenced building used by some of the inhabitants of X1016 for their daytime activities, and another fenced building whose function has not been reported (labelled as '13' and '12' respectively in de Pierrebourg 1999); these are not regarded as residences for the purposes of this study. The sample used here therefore comprises 100% of Xculoc's housing

stock, is statistically robust and fully representative of the community's domestic architecture and population.

1. *Actual sleeping spaces*: residents normally sleep in personal hammocks or shared hammocks suspended within huts referred to by de Pierrebourg as 'logis' (ibid. 66). These rooms are identified in de Pierrebourg's individual residence plans (ibid. 240-276). In hot weather, residents may instead sleep in kitchens (ibid. 66), but since these spaces are used as seasonal alternatives they are not counted here.
2. *Conjugal rooms*: any huts labelled as 'logis' that are known to currently accommodate one or more resident conjugal couple are counted. The users of these rooms can be identified from de Pierrebourg's Table 12 (ibid. 178).
3. *Formal sleeping spaces*: the count includes all huts labelled as 'logis'.
4. *Cooking spaces*: residents cook most of their meals on the hearths of rooms referred to as 'cuisines' by de Pierrebourg (ibid. 66). These spaces are identified in de Pierrebourg's individual residence plans (ibid. 240-276). Outdoor hearths may also be used (ibid. 57), but since these are located in unenclosed spaces they are not counted here. In situations where, according to de Pierrebourg's Table 5 (ibid. 172), some members of a co-residential group cook separately from others but possess no extra 'cuisine' or outdoor cooking facilities, they are assumed to cook on a hearth in their 'logis', which is included in the count. Otherwise, 'logis' are not counted here, even though breakfast and other secondary cooking activities may occasionally take place in such rooms.
5. *Eating spaces*: everyday meals are consumed in the rooms which de Pierrebourg refers to as 'cuisines' (ibid. 66), sitting on stools set around the hearth (ibid. 82). In situations where some members of a co-residential group eat separately from others but possess no extra 'cuisine' (ibid. 172, Table 5), it is assumed that they eat in a 'logis', and this is included in the count. All these spaces are identified in de Pierrebourg's individual residence plans (ibid. 240-276).
6. *Dwelling area*: this measurement represents the combined area of all enclosed spaces used on an everyday basis by the residents for sleeping, cooking, eating and congregating: it includes every 'actual sleeping space', 'cooking space' and 'eating space', as defined above. The measurements are derived from the catalogue of hut areas in de Pierrebourg's Table 12 (ibid. 178), which seem to exclude wall thickness.
7. *Ground-plan area*: this measurement represents the area of all spaces that become accessible once the enclosure wall of a residence has been entered, and includes all hut walls and the thickness of the enclosure wall. The measurements are derived from the column labelled '*superficie solares (m^2)*' in de Pierrebourg's Table 10 (ibid. 176).
8. *Multiple storeys*: huts do not have load-bearing walls and cannot support upper storeys.

9. *Residence age*: although de Pierrebourg's Table 12 (ibid. 178) lists the years in which the standing huts in the settlement were erected, many huts have replaced older abandoned or completely decayed huts within the residence boundary. The original date of construction for each residence is therefore instead derived from de Pierrebourg's Table 10 (ibid. 176), which classifies the residences into four age categories: '0-10 years', '10-20 years', '20-50 years', and '>50 years'. For the younger residences, where it was safe to assume that there had been no older huts that had been previously demolished and replaced, it was sometimes possible to calculate the precise age of the residence from the age of the oldest standing hut.
10. *Manner of acquisition*: most residences in the centre of the settlement were either inherited or freely acquired from relatives, while those on the edges were built by their current occupants (ibid. 51). Certain blocks of land appear to have been formerly larger residences that were subdivided amongst heirs (e.g. X1014-X1015-X118N-X118S-X1019, and X1033-X134N-X134S-X1035-X1036); the residences on these plots are regarded as having been acquired through inheritance (ibid. 51). All residences in the '>50 years' category which accommodate a young nuclear family are likely to have been inherited or re-appropriated from relatives rather than constructed by their current occupants; brackets are used in the Residence Table to highlight the uncertainty of this assumption. In cases where no data exists and inheritance either does not seem to be likely or is not the only plausible possibility, no entries were made.

APPENDIX E
Information about the co-residential groups in the sample

Key to fields

- *Co-residential group*: five-digit identifier for a co-residential group and the residence it occupies.

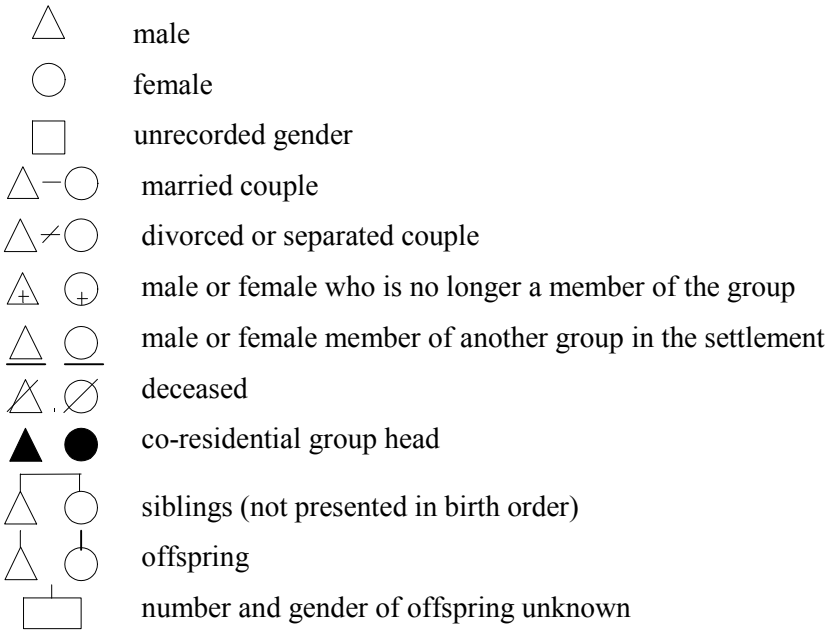
- *Households*: the labels used in the original ethnographic report to designate the groups of inhabitants occupying the residence in question.

- *Community*: the name of the community where the co-residential group lives.

- *Population*: the number of people recorded as members of the co-residential group during the period of ethnographic fieldwork. A resident, or member of the co-residential group, is any person who sleeps in the residence at night, either regularly or on a periodic basis. The count includes seasonal migrants, itinerant workers, and holidaymakers who return to the residence regularly, but who may not have been present at the time of recording. Individuals who are eligible to be members of the co-residential group but have been absent from the residence indefinitely or are known to have emigrated permanently are excluded.

- *Kinship structure*: diagram showing the gender of the residents and kinship relationships between them. For the purposes of this study, the eldest married resident with property rights (ownership or usufruct) over the residence is referred to as the head of a co-residential group. Headship is normally assigned to the eldest married man in the group; for the sake of consistency, headship may be assigned to a deceased man if there are no living married male co-residential group members. In Kireyka it is women who hold rights over residential property, and headship is accordingly assigned to the eldest married woman in a group. In Ban Touei, residential property is either inherited by women, or it is built or bought by men; headship is assigned to the eldest married female resident in cases where the residence is known to have been inherited by its current occupants, otherwise to the eldest married male resident.

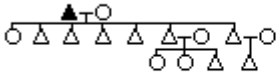
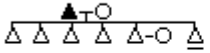
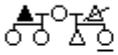
key to diagrams:

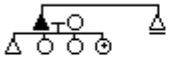
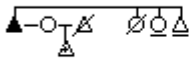
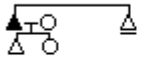


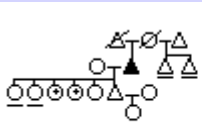
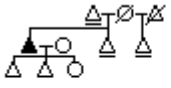
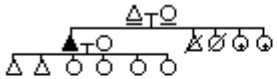
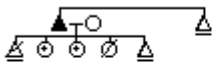
- *Number of conjugal couples*: total count of the socially recognised conjugal bonds that exist among the current residents. Polygamous male or female residents who have more than one co-resident spouse are counted repeatedly, once for each bond. Conjugal bonds that have been dissolved through death, divorce or separation are not counted. Conjugal bonds between residents and non-residents are also discounted.

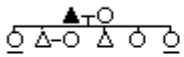
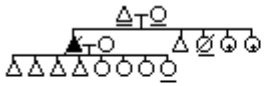
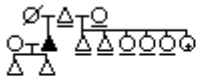
- *Kinship bond between couples*: classification of the types of relationships that exist between co-resident conjugal couples in a multi-conjugal group. A pair of conjugal partners can potentially be involved in more that one type of relationship with their married co-residents: in these cases, all relationships are noted. 'Other' includes instances of couples who have no kinship ties with (or are only distantly related to) any other couple in the group.

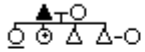
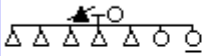
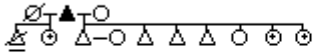
- *Comments*: clarifications about the kinship relations and population counts in the co-residential group, and additional notes about the group or its head. Errata in the ethnographic report are also noted.

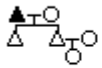
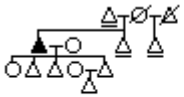
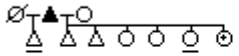
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
A1001	1	Aliabad	15		3	☑	☑	☐	☐	
A1002	2	Aliabad	7		1	☐	☐	☐	☐	
A1003	3	Aliabad	8		2	☑	☐	☐	☐	
A1004	4	Aliabad	5		1	☐	☐	☐	☐	The head is an immigrant (Kramer 1982: 139).
A1005	5	Aliabad	6		1	☐	☐	☐	☐	

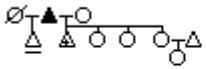
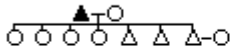
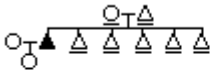
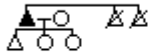
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
A1006	6	Aliabad	5		1	☐	☐	☐	☐	
A1007	7	Aliabad	5		1	☐	☐	☐	☐	
A1008	8	Aliabad	5		1	☐	☐	☐	☐	
A1009	9	Aliabad	2		1	☐	☐	☐	☐	
A1010	10	Aliabad	4		1	☐	☐	☐	☐	

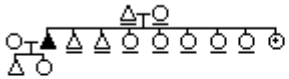
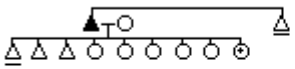
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
A1011	11	Aliabad	7		2	☑	☐	☐	☐	Includes the head's widowed stepfather (the father of the heads of A1012 and A1032).
A1012	12	Aliabad	5		1	☐	☐	☐	☐	
A1013	13	Aliabad	2		1	☐	☐	☐	☐	The head is an immigrant (Kramer 1982: 139).
A1014	14	Aliabad	8		1	☐	☐	☐	☐	
A1015	15	Aliabad	2		1	☐	☐	☐	☐	

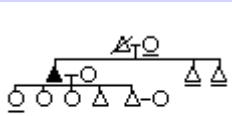
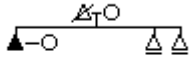
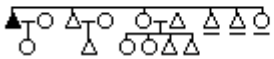
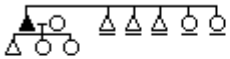
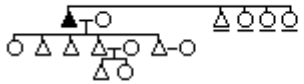
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
A1016	16	Aliabad	5		1	☐	☐	☐	☐	The whereabouts of the head's father are not recorded (Kramer 1982: Figure 2.2).
A1017	17	Aliabad	6		2	☑	☐	☐	☐	
A1018	18	Aliabad	9		2	☑	☐	☐	☐	Includes the head's married daughter and her family.
A1019	19	Aliabad	7		0	☐	☐	☐	☐	A population of '7' is recorded in Kramer's Table 3.7 (Kramer 1982: 73), but eight people appear on her kinship chart (ibid. Figure 2.2).
A1020	20	Aliabad	4		1	☐	☐	☐	☐	

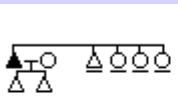
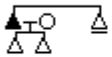
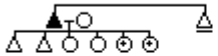
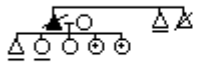
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
A1021	21	Aliabad	1		0	☐	☐	☐	☐	Consists of a lone widow.
A1022	22/24	Aliabad	12		2	☐	☑	☐	☐	Includes the widowed mother of the head.
A1023	23	Aliabad	5		2	☑	☐	☐	☐	Although the head has no other affinal kin in Aliabad, he was born there (Kramer 1982: 139).
A1025	25	Aliabad	7		0	☐	☐	☐	☐	
A1026	26/27	Aliabad	8		2	☑	☐	☐	☐	

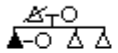
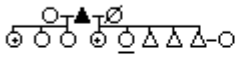
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
A1028	28	Aliabad	5		1	☐	☐	☐	☐	Includes one divorced daughter of the head.
A1029	29/30	Aliabad	6		2	☑	☐	☐	☐	The head is an immigrant (Kramer 1982: 139).
A1031	31/32	Aliabad	8		2	☑	☐	☐	☐	
A1033	33	Aliabad	6		1	☐	☐	☐	☐	
A1034	34	Aliabad	5		1	☐	☐	☐	☐	Although the head has no affinal kin in Aliabad, he was born there (Kramer 1982: 139).

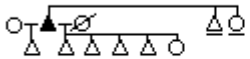
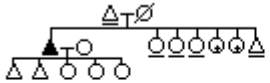
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
A1035	35/36	Aliabad	7		2	☑	☐	☐	☐	Includes the head's married daughter and her family. The whereabouts of one married son of the head (and his spouse) have not been recorded, and he is here assumed to be an emigrant.
A1037	37/38	Aliabad	8		2	☑	☐	☐	☐	A population of '8' is recorded in Kramer's Table 3.7 (Kramer 1982: 73), but nine people appear on her kinship chart (ibid. Figure 2.2).
A1039	39	Aliabad	4		0	☐	☐	☐	☐	Includes the widowed mother of the deceased head.
A103a	3a	Aliabad	3		1	☐	☐	☐	☐	
A1040	40	Aliabad	5		1	☐	☐	☐	☐	The head is an immigrant (Kramer 1982: 139).

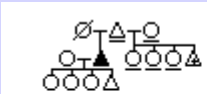
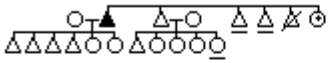
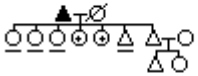
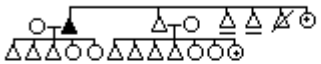
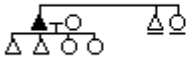
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
A1041	41/42	Aliabad	8		1	☐	☐	☐	☐	Includes the widowed mother and brother of the head. The head is an immigrant (Kramer 1982: 139).
A1043	43	Aliabad	6		1	☐	☐	☐	☐	
A1044	44/45	Aliabad	8		2	☑	☐	☐	☐	'Household 45' is mislabelled as '43' in Kramer's kinship chart (Kramer 1982: Figure 2.2). The head is an immigrant (ibid. 139).
A1046	46	Aliabad	4		1	☐	☐	☐	☐	
A1047	47	Aliabad	9		1	☐	☐	☐	☐	

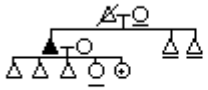
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
A1048	48	Aliabad	7		2	☑	☐	☐	☐	
A1049	49	Aliabad	3		1	☐	☐	☐	☐	Includes the widowed mother of the head.
A1050	50/51/52	Aliabad	12		3	☐	☑	☐	☐	Includes the head's married sister and her family.
A1053	53	Aliabad	5		1	☐	☐	☐	☐	
A1054	54/55/ 56	Aliabad	11		3	☑	☑	☐	☐	

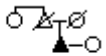
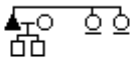
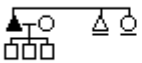
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
A1057	57	Aliabad	4		1	☐	☐	☐	☐	
A1058	58	Aliabad	4		1	☐	☐	☐	☐	
A1059	59	Aliabad	6		1	☐	☐	☐	☐	
A1060	60	Aliabad	5		1	☐	☐	☐	☐	
A1061	61	Aliabad	2		0	☐	☐	☐	☐	

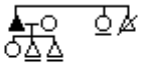
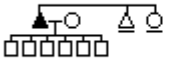
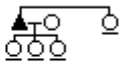
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
A1062	62	Aliabad	3		0	☐	☐	☐	☐	The three orphaned adolescent children of the head emigrated to Kangavar in the latter part of Kramer's ethnographic fieldwork period (Kramer 1982: 60).
A1063	63	Aliabad	6		1	☐	☐	☐	☐	
A1064	64	Aliabad	5		1	☐	☐	☐	☐	Includes the widowed mother and unmarried siblings of the head.
A1065	65/66	Aliabad	8		2	☑	☐	☐	☐	
A1067	67	Aliabad	4		1	☐	☐	☐	☐	Includes the widowed mother of the head

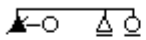
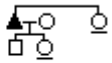
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
A1068	68/69	Aliabad	11		1	☐	☐	☐	☐	Includes the widowed mother and half-brother of the head.
A1070	70	Aliabad	6		1	☐	☐	☐	☐	
A1071	71	Aliabad	3		1	☐	☐	☐	☐	The father of the head may be alive but his whereabouts are not recorded.
A1072	72	Aliabad	8		1	☐	☐	☐	☐	
A1073	73	Aliabad	6		1	☐	☐	☐	☐	

Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
A1074	74	Aliabad	6		1	☐	☐	☐	☐	
A1075	75/76	Aliabad	14		2	☐	☑	☐	☐	
A1077	77/78	Aliabad	6		1	☐	☐	☐	☐	A population of '6' is recorded in Kramer's Table 3.7 (Kramer 1982: 73), but only five people appear in her kinship chart (ibid. Figure 2.2). The head's eldest married son is the head of A1073.
A1079	79/80	Aliabad	15		2	☐	☑	☐	☐	
A1081	81	Aliabad	6		1	☐	☐	☐	☐	

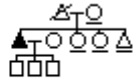
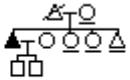
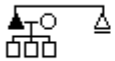
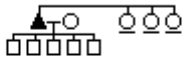
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
A1082	82	Aliabad	5		1	☐	☐	☐	☐	
A1083	83	Aliabad	5		1	☐	☐	☐	☐	
B1002	2	Baghestan	7		1	☐	☐	☐	☐	
B1003	3/6/8	Baghestan	20		3	☐	☐	☐	☑	The co-residential group resides in the 'Q'ala Reza Qoli'. The six adults are unrelated. No headship has been assigned to this group.
B1004	4/5	Baghestan	6		1	☐	☐	☐	☐	Includes the head's widowed sister-in-law and her child. The co-resident brother of the head died recently (Horne 1994: 110).

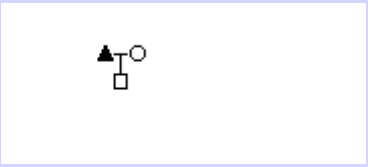
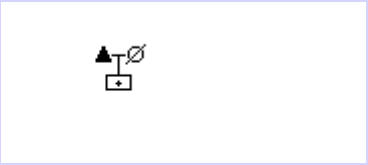
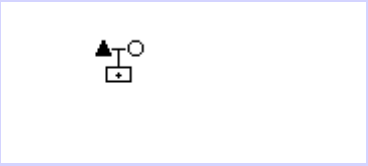
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
B1007	7	Baghestan	7		1	☐	☐	☐	☐	Includes the elderly father of the head, who resides separately from his mother (she resides in B1015).
B1009	9	Baghestan	3		1	☐	☐	☐	☐	Includes the head's aunt. No children are recorded, despite the couple being in its 50s (Horne 1994: 102).
B1010	10	Baghestan	6		1	☐	☐	☐	☐	
B1011	11	Baghestan	4		1	☐	☐	☐	☐	
B1012	12	Baghestan	5		1	☐	☐	☐	☐	

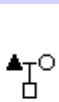
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
B1013	13	Baghestan	4		1	☐	☐	☐	☐	
B1014	14	Baghestan	3		1	☐	☐	☐	☐	Horne's Table 7 (Horne 1994: 102) erroneously counts a population of '4', but only lists three residents.
B1015	15	Baghestan	7		1	☐	☐	☐	☐	Includes the elderly mother of the head, who resides separately from his father (he resides in B1007).
B1016	16	Baghestan	8		1	☐	☐	☐	☐	
B1017	17	Baghestan	2		1	☐	☐	☐	☐	

Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
B1018	18	Baghestan	1		0	☐	☐	☐	☐	Consists of a lone widow.
B1019	19	Baghestan	6		1	☐	☐	☐	☐	
B1020	20	Baghestan	4		0	☐	☐	☐	☐	Includes a grandchild of the head, probably a child of the head's married daughter who resides in B1019.
B1022	22	Baghestan	3		1	☐	☐	☐	☐	
B1023	23	Baghestan	6		1	☐	☐	☐	☐	

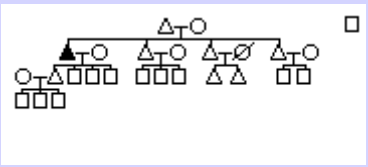
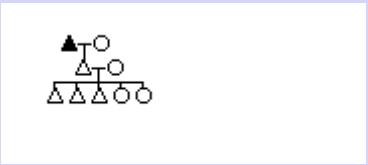
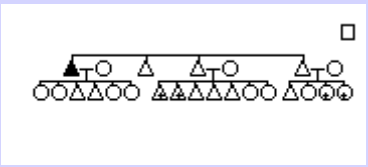
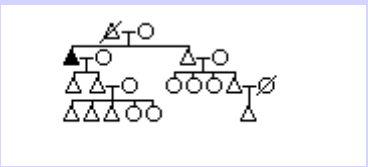
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
B1024	24	Baghestan	6		1	☐	☐	☐	☐	Horne's Table 9 (Horne 1994: 109) lists the head's wife as a widow, but widowhood is not indicated in Horne's Table 7 (ibid. 102).
B1025	25	Baghestan	2		1	☐	☐	☐	☐	Consists of a young, still childless couple (Horne 1994: 102).
B1026	26	Baghestan	7		1	☐	☐	☐	☐	Includes the head's mother-in-law.
B1027	27	Baghestan	3		1	☐	☐	☐	☐	Includes a grandchild of the head, probably a child of the head's married daughter who resides in B1032.
B1028	28	Baghestan	7		1	☐	☐	☐	☐	Includes the widowed mother of the head. Although Horne's Table 7 (Horne 1994: 102) lists this individual as 'FM' (father's mother), this is probably an error that should read 'HM' (husband's mother).

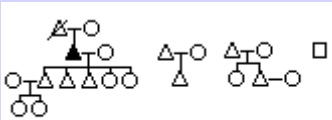
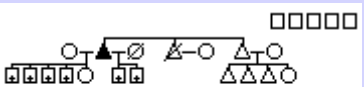
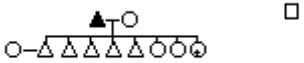
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
B1029	29	Baghestan	5		1	☐	☐	☐	☐	
B1031	31	Baghestan	4		1	☐	☐	☐	☐	
B1032	32	Baghestan	5		1	☐	☐	☐	☐	
B1033	33	Baghestan	5		1	☐	☐	☐	☐	
B1034	34	Baghestan	7		1	☐	☐	☐	☐	

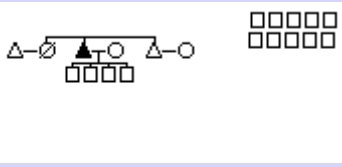
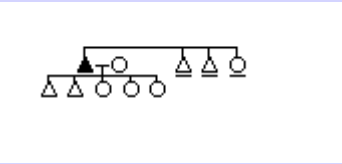
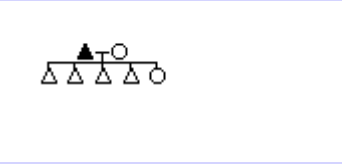
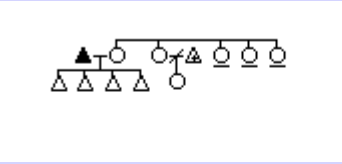
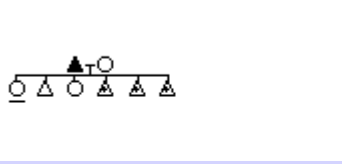
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
B1035	35	Baghestan	1		0	☐	☐	☐	☐	Consists of a lone male resident, who is unmarried and resides part-time with relatives in a neighbouring settlement (Horne 1994: 103).
C1032	32	Capileira	3		1	☐	☐	☐	☐	
C1033	33	Capiliera	6		1	☐	☐	☐	☐	Includes the widowed mother and sister-in-law of the head (Delaigue 1988: 109).
C1034	34	Capileira	1		0	☐	☐	☐	☐	The lone occupant is a pensioner (Delaigue 1988: Figure 13), of unrecorded gender, here assumed to be male. If the head has any adult children, they currently reside elsewhere.
C1041	41	Capileira	2		1	☐	☐	☐	☐	Consists of an elderly couple on a pension (Delaigue 1998: Figure 13). If the head has any adult children, they currently reside elsewhere.

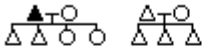
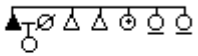
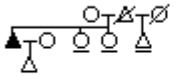
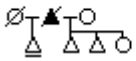
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
C1042	42	Capileira	3		1	☐	☐	☐	☐	
C1045	45	Capileira	4		1	☐	☐	☐	☐	
C1047	47	Capileira	1		0	☐	☐	☐	☐	The lone occupant is a young man residing as a tenant, free of charge, until the residence is formally assigned to an heir (Delaigue 1988: 115).
C1049	49	Capileira	3		1	☐	☐	☐	☐	
C1051	51	Capileira	5		1	☐	☐	☐	☐	

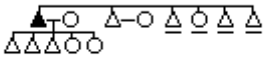
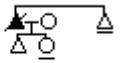
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
C1054	54	Capileira	2		1	☐	☐	☐	☐	Consists of an elderly couple on a pension (Delaigue 1988: Figure 13). If the head has any adult children, they currently reside elsewhere.
C1056	56	Capileira	6		1	☐	☐	☐	☐	
C1057	57	Capileira	3		1	☐	☐	☐	☐	Includes the widowed mother-in-law of the head (Delaigue 1988: 109).
D1001	Ut1	Denpasar	9		2	☐	☑	☐	☐	Includes an unrelated domestic servant.
D1002	Ut2	Denpasar	18		3	☑	☐	☐	☑	Includes four Javanese lodgers and a family of distant relatives (the family of the head's daughter-in-law's brother).

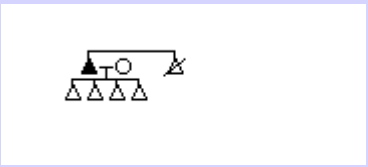
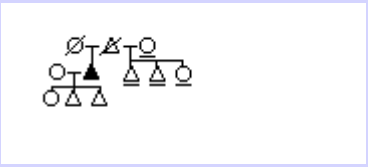
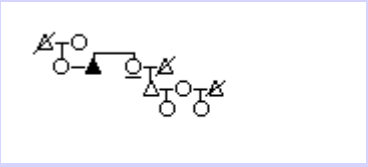
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
D1003	Ut3/Uc1/ Uc2/ Mi1	Denpasar	25		5	☑	☑	☐	☑	The head is not the oldest married member of the group (Lancret 1997: 163). Includes an unrelated domestic servant residing in household 'Uc1'. Lancret records a population of '25+1' (ibid. 267), but only twenty-five residents are mentioned in the text (ibid. 166).
D1005	Ut5	Denpasar	9		2	☑	☐	☐	☐	
D1006	Ut6/Uc4/ Mi3	Denpasar	21		3	☐	☑	☐	☐	Includes an unrelated domestic servant residing in household 'Uc4'. Two married nephews and two married nieces of the head reside elsewhere (Lancret 1997: 160).
D1007	Ut7	Denpasar	9		2	☑	☐	☐	☐	Includes two domestic servants.
D1011	Ut11/ Ut13	Denpasar	18		3	☑	☑	☐	☐	Includes the head's widowed mother.

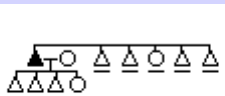
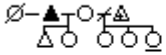
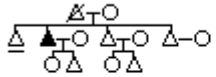
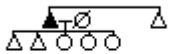
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
D1012	Ut12	Denpasar	20		5	☑	☐	☐	☑	Includes the head's widowed mother, an unrelated domestic servant, and two families of lodgers (Lancret 1997: 143, 154).
D1014	Ut14/ Uc3	Denpasar	15		2	☐	☑	☐	☐	Includes the head's widowed sister-in-law, two student lodgers and three immigrant lodgers (Lancret 1997: 202).
D1015	Ut15	Denpasar	10		1	☐	☐	☐	☐	
D1017	Ut17	Denpasar	11		2	☑	☐	☐	☐	Includes an unrelated domestic servant.
D1025	Mi5	Denpasar	5		1	☐	☐	☐	☐	

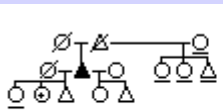
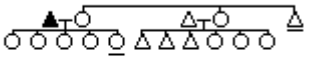
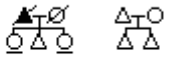
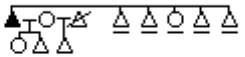
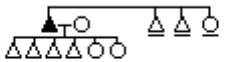
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
D1026	Mi6	Denpasar	19		2	☐	☑	☐	☐	Includes the head's brother-in-law and ten resident employees who work in the restaurant located on the ground floor of the residence.
H1003	3	Hasanabad	7		1	☐	☐	☐	☐	
H1004	4	Hasanabad	7		1	☐	☐	☐	☐	
H1006	6	Hasanabad	8		1	☐	☐	☐	☐	Includes the divorced sister-in-law of the head, together with her daughter.
H1007	7	Hasanabad	4		1	☐	☐	☐	☐	

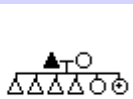
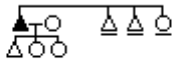
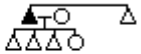
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
H1008	8	Hasanabad	5		1	☐	☐	☐	☐	Includes the widowed mother of the head.
H1009	9	Hasanabad	11		2	☐	☐	☐	☑	Includes the family of a gendarme, which rents a room (Watson 1979: 40, 46).
H1011	11	Hasanabad	4		0	☐	☐	☐	☐	
H1012	12	Hasanabad	4		1	☐	☐	☐	☐	Includes the widowed mother of the head.
H1013	13	Hasanabad	4		0	☐	☐	☐	☐	

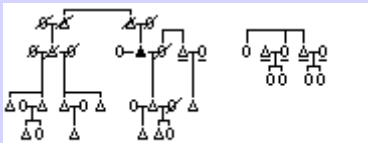
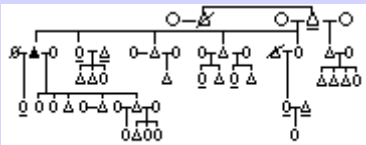
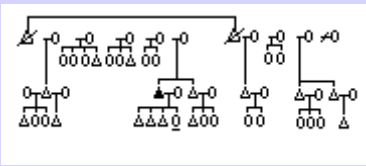
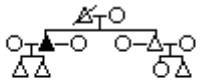
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
H1015	15	Hasanabad	4		1	☐	☐	☐	☐	The co-residential group emigrated during the period of fieldwork study (Watson 1979: 44).
H1016	16/44	Hasanabad	2		0	☐	☐	☐	☐	Another live female child of the head is mentioned in Watson's Table 2.3 (Watson 1979: 50) but is not shown on her kinship chart (ibid. Figure 6.3).
H1017	17	Hasanabad	3		1	☐	☐	☐	☐	
H1018	2/18	Hasanabad	9		2	☐	☑	☐	☐	The co-resident brothers are the eldest and youngest amongst their male siblings.
H1019	19	Hasanabad	2		0	☐	☐	☐	☐	

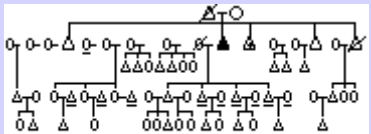
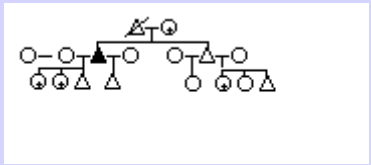
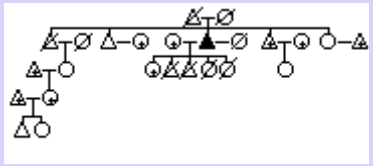
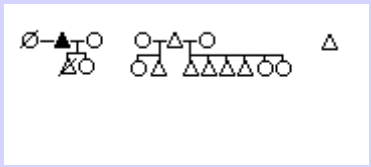
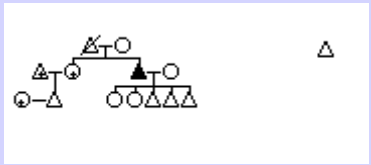
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
H1020	20	Hasanabad	6		1	☐	☐	☐	☐	
H1022	22	Hasanabad	1		0	☐	☐	☐	☐	The whereabouts of the head are not recorded; he is assumed here to be deceased.
H1023	23	Hasanabad	5		1	☐	☐	☐	☐	
H1024	24	Hasanabad	1		0	☐	☐	☐	☐	Consists of a lone widower. A male child of the head is mentioned in Watson's Table 2.3 (Watson 1979: 50), but does not appear in Watson's kinship chart (ibid. Figure 6.3) or elsewhere.
H1025	1/25	Hasanabad	7		2	☐	☐	☐	☑	Consists of the head's family and the family of his sister's son. Includes the head's mother-in-law, and his nephew's step-daughter.

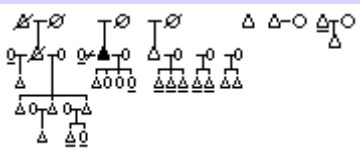
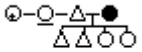
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
H1027	27	Hasanabad	6		1	☐	☐	☐	☐	The head's eldest son (aged 7) reportedly left Hasanabad for an unknown destination during Watson's fieldwork (Watson 1979: 224, Figure 6.3).
H1028	5/28	Hasanabad	6		2	☑	☐	☐	☐	A newborn son of the head is not shown in Watson's kinship chart (Watson 1979: Figure 6.3), but mentioned elsewhere (ibid. Table 2.3, Table 2.4 and p.143).
H1030	30	Hasanabad	6		1	☐	☐	☐	☐	Includes two children from the head's wife's first marriage. The co-residential group emigrated during the period of fieldwork study (Watson 1979: 45).
H1031	10/26/31	Hasanabad	11		3	☐	☑	☐	☐	Includes the widowed mother of the head. The youngest of the co-residing conjugal couples married very recently (Watson 1979: 211). The head has a newborn son (ibid. 54, Table 2.4) who is not shown in Watson's kinship chart (ibid. Figure 6.3).
H1032	32	Hasanabad	7		0	☐	☐	☐	☐	Includes the head's unmarried brother.

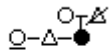
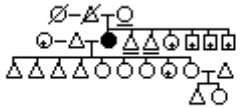
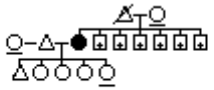
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
H1033	33	Hasanabad	5		1	☐	☐	☐	☐	Watson's kinship chart (Watson 1979: Figure 6.3) and Table 2.6 (ibid. 63) show that the head's first wife had three children only, whereas Table 2.4 (ibid. 54) assigns her four children.
H1034	34/29	Hasanabad	14		2	☐	☑	☐	☐	Consists of a pair of married sisters.
H1035	35	Hasanabad	5		1	☐	☐	☐	☐	Includes the family of gendarme, which rents a room (Watson 1979: 40, 46).
H1036	36	Hasanabad	5		1	☐	☐	☐	☐	Watson's kinship chart (Watson 1979: Figure 6.3) wrongly shows a daughter from the head's wife's first marriage, but her Tables 2.1 (ibid. 36) and 2.3 (ibid. 50) mention a son.
H1037	37	Hasanabad	8		1	☐	☐	☐	☐	

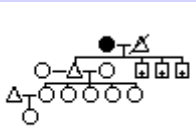
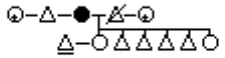
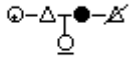
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
H1038	38	Hasanabad	7		1	☐	☐	☐	☐	
H1039	39	Hasanabad	5		1	☐	☐	☐	☐	
H1040	40	Hasanabad	7		1	☐	☐	☐	☐	Includes the brother of the head. The co-residential group emigrated during the period of fieldwork (Watson 1979: 46).
H1041	41	Hasanabad	1		0	☐	☐	☐	☐	Consists of a lone widow.
H1042	21/42/14	Hasanabad	12		3	☐	☑	☐	☐	Includes the head's orphaned nephew. The head has adult children (Watson 1979: 51,55, Tables 2.3, 2.4), who are not shown in the kinship chart (ibid. Figure 6.3). The married daughter of his middle brother ('21') appears only in the kinship chart and in Table 2.6 (ibid.62).

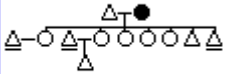
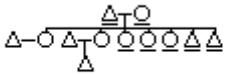
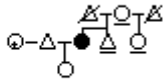
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
H1043	43	Hasanabad	4		1	☐	☐	☐	☐	The co-residential group emigrated during the period of fieldwork study (Watson 1979: 46).
I1001	plan 10.2	Ibadan	22		4	☑	☑	☐	☑	Consists of the families of the head, his married son, and his cousin's sons. Includes the nephew of the head's first wife, and five female tenants who are not related to the head.
I1004	4	Ibadan	37		9	☑	☑	☑	☑	Consists of the families of the head, his sons, brothers and half-brother. Includes the head's mother and her co-wife (his father appears to be permanently absent), his aunt, his widowed sister and her granddaughter, and the children of a sister who resides elsewhere.
I1005	5	Ibadan	48		7	☐	☑	☑	☑	Consists of the families of the head, his brother and half-brother, and his cousins. Includes the head's widowed mother together with her co-wives and their children, and the wives and children of the head's deceased uncle.
I1006	6	Ibadan	11		4	☐	☑	☑	☐	Consists of the head's two wives and children, and the head's brother with his wives and children. Includes the head's widowed mother.

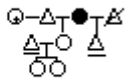
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
I1009	9	Ibadan	50		12	☑	☑	☑	☑	Consists of the families of the head and his brothers. Includes the head's widowed mother, his widowed sister-in-law and her children, three married daughters whose husbands are indefinitely absent, and five grandchildren whose parents reside elsewhere.
I1012	12	Ibadan	12		5	☐	☑	☑	☐	Consists of the head's wives and children, and the head's brother's wives and children.
I1026	26	Ibadan	7		0	☐	☐	☐	☐	Consists of the elderly head and a married brother, sister and niece of the head, each of whom has a spouse who resides elsewhere. Includes the head's young niece and two great-grandchildren of the head's deceased brother.
I1034	34	Ibadan	15		3	☐	☐	☑	☑	Includes an unrelated tenant family and a single unrelated tenant.
I1042	42	Ibadan	11		1	☐	☐	☐	☐	Includes the head's widowed mother, his married nephew (whose wife resides elsewhere), and an unrelated individual.

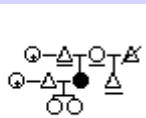
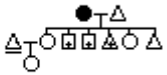
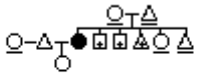
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
I1053	53	Ibadan	24		7	☐	☑	☑	☑	Consists of the families of the head and his half-brothers (one of whom is deceased). Includes two unrelated tenant families (the male spouse in one of the families resides elsewhere) and an individual unrelated tenant.
K1001	1	Kireyka	7		1	☐	☐	☐	☐	
K1002	2	Kireyka	5		1	☐	☐	☐	☐	
K1003	3	Kireyka	6		1	☐	☐	☐	☐	The husband of the head also resides part-time with his other wife in K1035, and part-time outside Kireyka with yet another wife. The head moved to another compound towards the end of Tobert's fieldwork period (Tobert 1988: 238).
K1004	4	Kireyka	5		1	☐	☐	☐	☐	

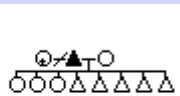
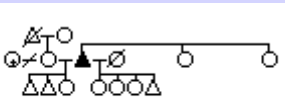
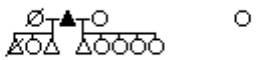
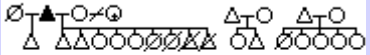
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
K1005	5	Kireyka	3		1	☐	☐	☐	☐	Includes the widowed mother of the head (Tobert 1988: 103). The husband of the head also resides part-time with his other wife in K1037.
K1006	6	Kireyka	3		0	☐	☐	☐	☐	
K1008	8/9	Kireyka	13		2	☑	☐	☐	☐	Consists of the head's family and the family of her married daughter. Another married daughter who was previously a resident emigrated in 1984 (Tobert 1988: 120-1).
K1012	12	Kireyka	1		0	☐	☐	☐	☐	Consists of a lone widow.
K1013	13	Kireyka	6		1	☐	☐	☐	☐	The husband of the head also resides part-time with his other wife in K1047.

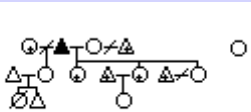
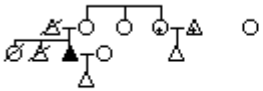
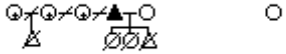
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
K1014	14	Kireyka	4		1	☐	☐	☐	☐	
K1015	15/16/17/18	Kireyka	11		3	☑	☐	☑	☐	Consists of the widowed head, the co-wives of the head's son, and the family of the recently married grand-daughter of the head.
K1019	19	Kireyka	8		1	☐	☐	☐	☐	The head recently remarried (Tobert 1988: 241). The head's husband also resides part-time outside Kireyka with his other wife. The head's betrothed daughter resides in this residence part-time, without her future husband.
K1020	20	Kireyka	2		1	☐	☐	☐	☐	The future husband of the head also resides part-time outside Kireyka with his other wife (Tobert 1988: 113). The head also resides part-time in K1019.
K1022	22	Kireyka	2		1	☐	☐	☐	☐	The head's husband also resides part-time outside Kireyka with his other wife. Tobert's kinship chart indicates the existence of another husband (Tobert 1988: 108), who is assumed here to be deceased.

Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
K1023	23	Kireyka	9		1	☐	☐	☐	☐	
K1024	24	Kireyka	9		1	☐	☐	☐	☐	The head's two betrothed daughters and one grandson also reside in this residence on a part-time basis, buy without their future husbands.
K1025	25/26	Kireyka	5		2	☐	☑	☐	☐	Consists of a pair of betrothed sisters, who reside part-time in K1024, and their future husbands. No headship has been assigned to this group.
K1027	27	Kireyka	3		0	☐	☐	☐	☐	The head's betrothed daughter and granddaughter also reside in this residence on a part-time basis, but without the daughter's future husband.
K1028	28	Kireyka	3		1	☐	☐	☐	☐	The future husband of the head also resides part-time outside Kireyka with his other wife. The head and her daughter reside part-time in K1027.

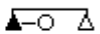
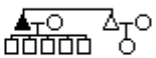
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
K1029	29	Kireyka	3		1	☐	☐	☐	☐	
K1030	30/31/32	Kireyka	9		2	☐	☑	☐	☐	Consists of the widowed head and her two recently married daughters. The husband of one of the head's daughters also resides part-time outside Kireyka with his other wife (Tobert 1988: 113).
K1035	35	Kireyka	5		1	☐	☐	☐	☐	The husband of the head also resides part-time with another wife in K1003, and outside Kireyka with yet another wife.
K1037	36	Kireyka	6		1	☐	☐	☐	☐	The head resided in compound '37' at the beginning of the ethnographic season, but moved to this residence (compound '36') in 1984/5 (Tobert 1988: 168). The husband of the head resides here and also resides part-time with his other wife in K1005.also
K1038	38	Kireyka	5		1	☐	☐	☐	☐	The husband of the head resides part-time outside Kireyka with his other wife. The head's betrothed daughter and granddaughters also reside in this residence on a part-time basis, but without the daughter's future husband.

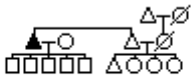
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
K1039	39	Kireyka	4		1	☐	☐	☐	☐	The future husband of the head also resides part-time outside Kireyka with his other wife (Tobert 1988: 113). The head and her daughters reside part-time in K1038.
K1046	46	Kireyka	6		1	☐	☐	☐	☐	The head's betrothed daughter and grandaughter also reside in this residence on a part-time basis, but without the daughter's future husband.
K1047	47	Kireyka	3		1	☐	☐	☐	☐	The future husband of the head also resides part-time with his other wife in K1013. The head and her daughter reside part-time in K1046.
K1050	50	Kireyka	1		0	☐	☐	☐	☐	The lone occupant has no relatives in Kireyka, and is a social outcast of 'Sultan' status (Tobert 1988: 110).
M1012	12	Marrakech	14		3	☑	☑	☐	☐	Includes the head's elderly parents, who have passed on headship to their firstborn son (Schwerdtfeger 1982: 235).

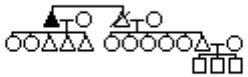
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
M1022	22	Marrakech	10		1	☐	☐	☐	☐	
M1026	26	Marrakech	12		1	☐	☐	☐	☐	Includes the head's two widowed sisters, the children of the head's deceased wife, and the head's widowed mother-in-law.
M1045	45	Marrakech	10		1	☐	☐	☐	☐	Includes an unrelated woman, and the children of the head's deceased wife.
M1062	62	Marrakech	10		2	☑	☐	☐	☐	Includes the head's married daughter and her family, and the children of the head's absent wife.
M1066	66	Marrakech	18		3	☐	☐	☐	☑	Includes two unrelated tenant families.

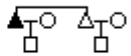
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
M119A	19 entrance A	Marrakech	8		2	☑	☐	☐	☐	Includes an unrelated woman, one divorced daughter of the head, one grandaughter of the head whose parents reside elsewhere, and the head's married daughter (from a former wife) with her family.
M119B	19 entrance B	Marrakech	7		1	☐	☐	☐	☐	Includes an unrelated woman, the head's widowed mother, widowed aunt and cousin.
M128A	28 entrance A	Marrakech	24		3	☑	☑	☐	☐	Includes the head's two grandaughters by a widowed daughter who resides elsewhere.
M128B	28 entrance B	Marrakech	3		1	☐	☐	☐	☐	Includes an unrelated female resident, probably an adopted child to judge from her position in Schwerdtfeger's kinship chart (Schwedtfeger 1982: 237).
M128C	28 entrance C	Marrakech	10		1	☐	☐	☐	☐	Includes the head's widowed mother-in-law.

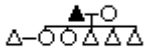
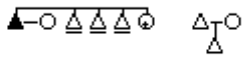
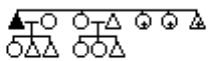
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
N1001	1	Anegondi	2		1	☐	☐	☐	☐	Consists of a young, still childless couple (Tobert 2000: 89).
N1002	2	Anegondi	9		1	☐	☐	☐	☐	Includes the head's widowed mother-in-law.
N1003	3	Anegondi	3		1	☐	☐	☐	☐	Includes the head's widowed mother-in-law.
N1004	4	Anegondi	6		1	☐	☐	☐	☐	
N1005	5	Anegondi	3		1	☐	☐	☐	☐	

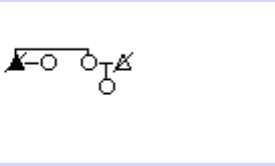
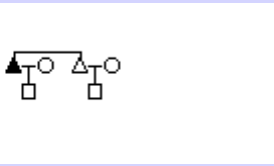
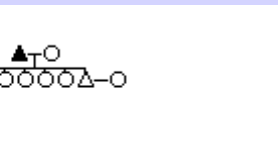
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
N1006	6	Anegondi	6		1	☐	☐	☐	☐	Includes the widowed mother of the head.
N1007	7	Anegondi	6		1	☐	☐	☐	☐	
N1009	9	Anegondi	4		1	☐	☐	☐	☐	Includes the head's sister-in-law.
N1010	10	Anegondi	3		1	☐	☐	☐	☐	Consists of a young, still childless couple. Includes the head's brother.
N1011	11	Anegondi	10		2	☐	☑	☐	☐	

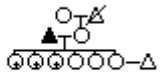
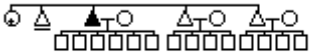
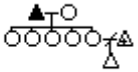
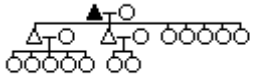
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
N1012	12	Anegondi	13		1	☐	☐	☐	☐	Includes the father-in-law of the head's brother.
N1013	13	Anegondi	4		1	☐	☐	☐	☐	
N1014	14	Anegondi	3		0	☐	☐	☐	☐	
N1015	15	Anegondi	6		1	☐	☐	☐	☐	Includes the head's widowed mother-in-law.
N1016	16	Anegondi	11		1	☐	☐	☐	☐	

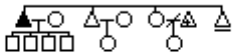
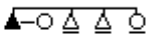
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
N1017	17	Anegondi	4		1	☐	☐	☐	☐	
N1018	18	Anegondi	7		0	☐	☐	☐	☐	
N1019	19	Anegondi	3		1	☐	☐	☐	☐	
N1020	20	Anegondi	3		1	☐	☐	☐	☐	
N1021	21/22	Anegondi	18		2	☐	☐	☐	☑	Consists of the families of the head, his deceased brother, and his married nephew.

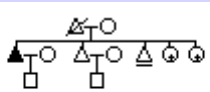
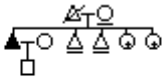
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
N1023	23	Anegondi	8		2	☑	☐	☐	☐	
N1024	24	Anegondi	12		2	☑	☐	☐	☐	Includes the head's married daughter and her family.
N1026	26	Anegondi	7		1	☐	☐	☐	☐	
N1027	27	Anegondi	3		1	☐	☐	☐	☐	
N1028	28	Anegondi	6		2	☐	☑	☐	☐	

Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
N1029	29	Anegondi	16		2	☐	☑	☐	☐	Includes the widowed mother of the head.
N1030	30	Anegondi	4		1	☐	☐	☐	☐	Includes the widowed mother of the head, and the head's aunt.
N1031	31	Anegondi	8		2	☑	☐	☐	☐	Includes the head's married daughter and her husband.
N1032	32	Anegondi	5		2	☐	☐	☐	☑	Includes an unrelated tenant family (Tobert 2000: 132).
N1034	34, 35	Anegondi	10		2	☐	☑	☐	☐	Includes the head's married sister and her family (Tobert 2000: 136). Tobert's kinship chart for this residence also depicts the head's parents and unmarried siblings (ibid. Appendix 2), but they are not mentioned in the text as residents and it is assumed here that they are not present.

Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
N1036	36	Anegondi	2		1	☐	☐	☐	☐	
N1037	37	Anegondi	3		0	☐	☐	☐	☐	Includes the deceased head's widowed sister and her daughter.
N1038	38	Anegondi	6		2	☐	☑	☐	☐	Tobert's kinship chart for this residence also depicts the head's parents (Tobert 2000: Appendix 2), but as they are not mentioned in the text as residents and the head's father has not been ascribed headship (ibid. 142), they are assumed here not to be present.
N1039	39	Anegondi	2		1	☐	☐	☐	☐	
N1040	40	Anegondi	9		2	☑	☐	☐	☐	

Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
N1041	41	Anegondi	7		2	☑	☐	☐	☐	Includes the head's mother-in-law and the head's married daughter with her husband.
N1042	42	Anegondi	20		3	☐	☑	☐	☐	
N1043	43	Anegondi	8		1	☐	☐	☐	☐	Includes the head's grandson by a daughter who is assumed here to be divorced.
N1044	44	Anegondi	4		1	☐	☐	☐	☐	
N1046	46	Anegondi	18		3	☑	☑	☐	☐	

Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
N1047	47	Anegondi	6		1	☐	☐	☐	☐	
N1048	48	Anegondi	5		1	☐	☐	☐	☐	
N1049	49	Anegondi	7		1	☐	☐	☐	☐	Includes the widowed mother of the head. Tobert's kinship chart (Tobert 2000: Appendix 2) depicts one of the head's sons as married, but his spouse was not introduced to the residence until a later stage in Tobert's fieldwork period (ibid. 172).
N108E	8 a-d, f	Anegondi	11		2	☐	☑	☐	☐	Includes the head's divorced sister and her daughter.
N108W	8 e	Anegondi	2		1	☐	☐	☐	☐	

Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
N133E	33a, b, c, d, e	Anegondi	7		2	☐	☑	☐	☐	Includes the widowed mother of the head. Tobert's kinship chart for this residence (Tobert 2000: Appendix 2) also depicts the head's father, but he is assumed to be deceased as he is not mentioned as a resident in the text (ibid. 134).
N133W	33 h, g	Anegondi	3		1	☐	☐	☐	☐	
P1001	1	Pobia	>2		1	☐	☐	☐	☐	
P1002	2	Pobia	>2		1	☐	☐	☐	☐	
P1003	3	Pobia	>2		1	☐	☐	☐	☐	

Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
P1004	4	Pobia	3		1	☐	☐	☐	☐	Includes the mother or mother-in-law of the head. The presence of a 'spare bedroom' suggests the existence of adult children who currently reside elsewhere.
P1005	5	Pobia	>4		2	☑	☐	☐	☐	Includes the head's newly married son and his wife (Trova 1989: 28).
P1007	7	Pobia	2		1	☐	☐	☐	☐	
P1008	8	Pobia	>2		1	☐	☐	☐	☐	
P1009	9	Pobia	1		0	☐	☐	☐	☐	Consists of a lone widow (Trova 1989: 30). The presence of a 'spare bedroom' suggests the existence of adult children who currently reside elsewhere.

Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
P1010	10	Pobia	>2		1	☐	☐	☐	☐	
P1011	11	Pobia	>2		1	☐	☐	☐	☐	
P1012	12	Pobia	2		1	☐	☐	☐	☐	
P1013	13	Pobia	>3		1	☐	☐	☐	☐	Includes the mother or mother-in-law of the head.
P1014	14	Pobia	>2		1	☐	☐	☐	☐	The head has a married son who resides elsewhere (Trova 1989: 33).

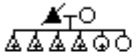
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
P1015	15	Pobia	2		1	☐	☐	☐	☐	The presence of a 'spare bedroom' suggests the existence of adult children who currently reside elsewhere.
P1016	16	Pobia	>2		1	☐	☐	☐	☐	
P1017	17	Pobia	>2		1	☐	☐	☐	☐	
P1018	18	Pobia	>2		1	☐	☐	☐	☐	
P1019	19	Pobia	2		1	☐	☐	☐	☐	The presence of a 'spare bedroom' suggests the existence of adult children who currently reside elsewhere.

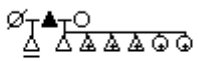
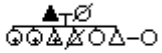
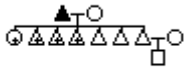
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
P1020	20	Pobia	>2		1	☐	☐	☐	☐	
P1021	21	Pobia	>2		1	☐	☐	☐	☐	
P1022	22	Pobia	>2		1	☐	☐	☐	☐	
P1023	23	Pobia	2		1	☐	☐	☐	☐	
P1024	24	Pobia	>2		1	☐	☐	☐	☐	

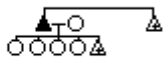
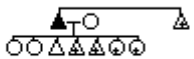
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
P1025	25	Pobia	>2		1	☐	☐	☐	☐	
P1026	26	Pobia	>2		1	☐	☐	☐	☐	
P1027	27	Pobia	>2		1	☐	☐	☐	☐	
P1028	28	Pobia	2		1	☐	☐	☐	☐	
P1029	29	Pobia	2		1	☐	☐	☐	☐	

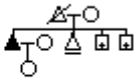
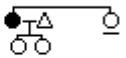
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
P1030	30	Pobia	>3		1	☐	☐	☐	☐	Includes the mother or mother-in-law of the head.
P1031	31	Pobia	>2		1	☐	☐	☐	☐	
P1032	32	Pobia	>2		1	☐	☐	☐	☐	
P1033	33	Pobia	2		1	☐	☐	☐	☐	
P1034	34	Pobia	>2		1	☐	☐	☐	☐	

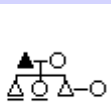
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
P1035	35	Pobia	>2		1	☐	☐	☐	☐	
P1036	36	Pobia	>2		1	☐	☐	☐	☐	
P1037	37	Pobia	>3		1	☐	☐	☐	☐	Includes the mother or mother-in-law of the head.
P1038	38	Pobia	>2		1	☐	☐	☐	☐	
P1039	39	Pobia	>2		1	☐	☐	☐	☐	

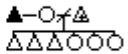
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
P1040	40	Pobia	2		1	☐	☐	☐	☐	
R1001	1	Karapinar	13		2	☐	☐	☐	☑	Consists of the family of the head and the family of his cousin. The latter has reoccupied an abandoned segment of the residence belonging to the head's brother (Aurenche et al. 1997: 217). The head's adult children are part-time residents (ibid. 225).
R1002	2	Karapinar	2		0	☐	☐	☐	☐	
R1003	3	Karapinar	2		1	☐	☐	☐	☐	Consists of an elderly couple (Aurenche et al. 1997: 228). If the head has any adult children, they are now absent.
R1004	4	Karapinar	2		0	☐	☐	☐	☐	

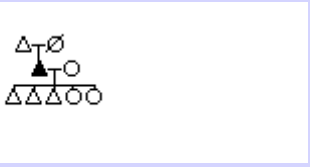
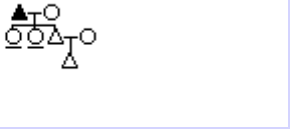
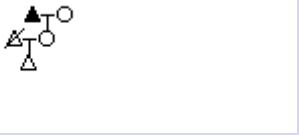
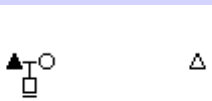
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
R1006	6	Karapinar	3		1	☐	☐	☐	☐	
R1008	8	Karapinar	7		1	☐	☐	☐	☐	Includes the head's son, who is temporarily away on military service (Aurenche et al. 1997: 235).
R1009	9	Karapinar	1		0	☐	☐	☐	☐	Consists of a lone widower.
R1010	10	Karapinar	4		1	☐	☐	☐	☐	Includes the head's married son and his wife, who reside part-time outside Karapinar (Aurenche et al. 1997: 239).
R1011	11	Karapinar	7		2	☑	☐	☐	☐	Includes the head's unmarried son, who is temporarily away on military service (Aurenche et al. 1997: 239). The head is assumed to have a resident grandchild, pictured in the published photograph 'K48' (ibid. 243).

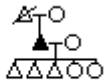
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
R1013	13	Karapinar	2		0	☐	☐	☐	☐	
R1014	14	Karapinar	6		1	☐	☐	☐	☐	
R1016	16	Karapinar	6		1	☐	☐	☐	☐	The head and his wife reside part-time outside Karapinar (Aurenche et al. 1997: 245). Includes the head's widowed mother and her co-wife, and the head's two unmarried sisters.
R1019	19	Karapinar	6		1	☐	☐	☐	☐	Includes the head's married daughter. The head, his wife and their sons reside part-time in Malatya, while the married daughter of the head resides part-time in Istanbul (Aurenche et al. 1997: 248).
R1020	20	Karapinar	5		1	☐	☐	☐	☐	

Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
R1021	21	Karapinar	2		0	☐	☐	☐	☐	Includes an unrelated domestic servant.
R118A	18 Bloc A	Karapinar	4		1	☐	☐	☐	☐	Includes the widowed mother of the head.
R118B	18 Bloc B	Karapinar	6		1	☐	☐	☐	☐	
T1001	1	Ban Touei	4		1	☐	☐	☐	☐	
T1002	2	Ban Touei	6		1	☐	☐	☐	☐	

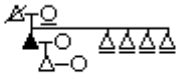
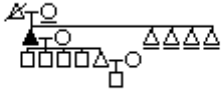
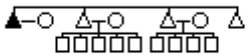
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
T1003	3	Ban Touei	4		2	☑	☐	☐	☐	Includes the head's youngest son and his wife (Clement-Charpentier and Clement 1990: 209).
T1004	4	Ban Touei	7		1	☐	☐	☐	☐	
T1005	5	Ban Touei	6		1	☐	☐	☐	☐	
T1007	7	Ban Touei	3		0	☐	☐	☐	☐	Includes an unrelated agricultural labourer. The divorced head remarried shortly after the study (Clement-Charpentier and Clement 1990:209).
T1008	8	Ban Touei	5		1	☐	☐	☐	☐	Includes the mother of the head (her husband is assumed to be deceased) and the daughter of her deceased sister.

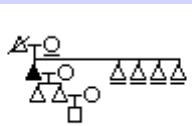
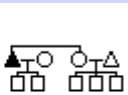
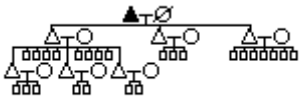
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
T1009	9	Ban Touei	1		0	☐	☐	☐	☐	Consists of a lone widow.
T1010	10	Ban Touei	5		1	☐	☐	☐	☐	
T1011	11	Ban Touei	3		1	☐	☐	☐	☐	
T1012	12	Ban Touei	1		0	☐	☐	☐	☐	Consists of a lone divorcee.
T1013	13	Ban Touei	8		1	☐	☐	☐	☐	

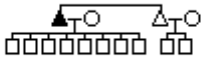
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
W1001	1	Willow Lake	3		1	☐	☐	☐	☐	
W1002	2	Willow Lake	8		1	☐	☐	☐	☐	Includes the widowed father of the head. The head and his family until recently resided in W1003, which belongs to the parents of the head's wife (Janes 1983: 35).
W1003	3	Willow Lake	5		2	☑	☐	☐	☐	
W1004	4	Willow Lake	4		1	☐	☐	☐	☐	Includes the head's daughter (who is assumed to be a widow, since her husband is absent), and the head's grandson.
W1005	5	Willow Lake	3		1	☐	☐	☐	☐	Includes an unrelated unmarried adult man. The head has a child who resides elsewhere (Janes 1983: 75).

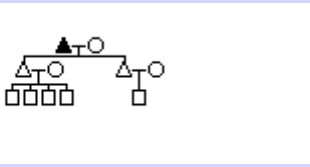
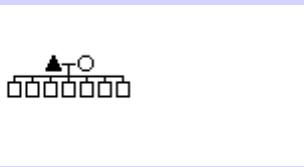
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
W1006	6	Willow Lake	8		1	☐	☐	☐	☐	Includes the head's widowed mother.
W1007	7	Willow Lake	4		1	☐	☐	☐	☐	
X1001	1	Xculoc	5		1	☐	☐	☐	☐	
X1003	3	Xculoc	8		2	☑	☐	☐	☐	
X1005	5E	Xculoc	2		1	☐	☐	☐	☐	

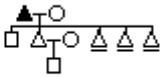
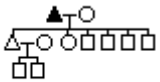
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
X1006	6	Xculoc	6		1	☐	☐	☐	☐	
X1007	7	Xculoc	4		1	☐	☐	☐	☐	
X1008	8	Xculoc	8		1	☐	☐	☐	☐	
X1009	9	Xculoc	7		2	☑	☐	☐	☐	
X1010	10	Xculoc	4		1	☐	☐	☐	☐	

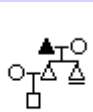
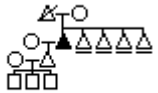
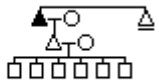
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
X1011	11	Xculoc	5		1	☐	☐	☐	☐	
X1014	14	Xculoc	4		2	☑	☐	☐	☐	
X1015	15	Xculoc	9		2	☑	☐	☐	☐	
X1016	16	Xculoc	16		3	☐	☑	☐	☐	Consists of the families of the head and his brothers. Whilst all residents regularly sleep in this residence, one of the families possesses additional living space elsewhere in the settlement which they only use during the day (de Pierrebourg 1999: 49).
X1017	17	Xculoc	7		2	☑	☐	☐	☐	

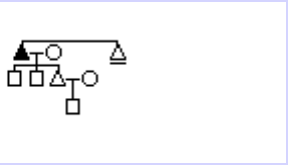
Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
X1019	19	Xculoc	6		2	☑	☐	☐	☐	De Pierrebourg's catalogue of inhabitants (de Pierrebourg 1999: Table 5) counts two people in the oldest generation of the co-residential group, but then erroneously labels the head as a widower.
X1020	20	Xculoc	9		2	☐	☑	☐	☐	Consists of the head's family and the family of his married sister. This co-residential arrangement is considered by the community to be temporary (de Pierrebourg 1999: 50).
X1021	21	Xculoc	4		1	☐	☐	☐	☐	
X1022	22	Xculoc	9		1	☐	☐	☐	☐	
X1023	23	Xculoc	38		6	☑	☑	☐	☐	De Pierrebourg's catalogue of inhabitants (de Pierrebourg 1999: Table 5) assigns all of the head's married grandchildren to one of the head's sons, whilst the text instead states that they are the offspring of two of the head's sons (ibid. 50).

Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
X1024	24	Xculoc	8		1	☐	☐	☐	☐	
X1025	25	Xculoc	2		0	☐	☐	☐	☐	
X1026	26	Xculoc	14		2	☐	☑	☐	☐	
X1027	27	Xculoc	2		1	☐	☐	☐	☐	
X1028	28	Xculoc	5		1	☐	☐	☐	☐	

Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
X1029	29	Xculoc	4		1	☐	☐	☐	☐	
X1030	30	Xculoc	11		3	☑	☑	☐	☐	
X1031	31	Xculoc	3		1	☐	☐	☐	☐	
X1032	32	Xculoc	6		1	☐	☐	☐	☐	
X1033	33	Xculoc	9		1	☐	☐	☐	☐	

Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
X1035	35	Xculoc	11		1	☐	☐	☐	☐	
X1036	36	Xculoc	6		2	☑	☐	☐	☐	
X1037	37	Xculoc	3		0	☐	☐	☐	☐	Includes the head's sister (de Pierrebourg 1999: 49).
X1039	39	Xculoc	2		0	☐	☐	☐	☐	
X1040	40	Xculoc	11		2	☑	☐	☐	☐	Includes an adult daughter of the head who seasonally emigrates to carry out her studies (de Pierrebourg 1999:49).

Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
X104N	4N	Xculoc	5		2	☑	☐	☐	☐	
X104S	4S	Xculoc	8		1	☐	☐	☐	☐	
X118N	18N	Xculoc	7		2	☑	☐	☐	☐	
X118S	18S	Xculoc	8		2	☑	☐	☐	☐	Includes the head's widowed mother.
X134N	34N	Xculoc	10		2	☑	☐	☐	☐	

Co-residential group	Households	Community	Population	Kinship structure	Number of conjugal couples	Kinship bond between couple				Comments
						Parent and child	Siblings	Co-spouse	Other	
X134S	34S	Xculoc	7		2	☑	☐	☐	☐	
X138N	38N	Xculoc	8		1	☐	☐	☐	☐	
X138S	38S	Xculoc	11		1	☐	☐	☐	☐	

APPENDIX F
Residential patterns in the fourteen communities in the sample

This appendix presents evidence for the identification of the residential pattern practised by the communities in the sample. As proposed in Section 2.4, identification is based mainly on ethnographers' evaluations of the living arrangements and residential decisions that are considered normal and appropriate by the inhabitants of a community. Where this information is absent, reference is made to ethnographic observations from ethnically similar communities instead. Wherever possible, the residential circumstances of newlyweds and indications of 'aversion trends' in the community are brought in as additional evidence.

The fourteen communities are discussed in alphabetical order according to the first letter of their codes.

Aliabad

Kramer reports the expectation amongst the inhabitants of Aliabad that married couples should reside in the parental residence of the groom (Kramer 1982: 21, 117); in addition, she reports that the female consanguineous relatives of the co-residential group's head are normally expected to leave the residence after their marriage (ibid. 139). This suggests that the custom in Aliabad is for the head to share a residence with his own wife and unmarried children, and with his male consanguineous relatives, their spouses, and their families of procreation, pointing to the operation of a *joint residential pattern*.

This interpretation finds support in the residential circumstances of newlyweds. There are 19 recently married men in the community, identifiable by the fact that their wives have not yet borne any children or have only one infant child (ibid. Table 3.7)[1]: three quarters (74%) of those men continue to live in their natal co-residential groups together with their wives. Further support is offered by the fact that, despite frequent occurrences of co-residence between married men and their married sons and brothers, married men across the entire community seem averse to sharing a residence with their married daughters (co-residence occurs in only two out of 19 possible cases) or their married sisters (co-residence occurs in just one out of 15 possible cases).

Baghestan

Horne reports that the inhabitants of Baghestan do not expect younger generations to remain in their parental residences after marriage (Horne 1994: 170); in order to practise neolocality, as is expected of them, betrothed couples are forced to delay their weddings until independent

[1] These couples reside in: A1001, A1003, A103a, A1011, A1013, A1017, A1018, A1023, A1026, A1029, A1031, A1035, A1037, A1048, A1050 (2 men), A1054, A1064 and A1071.

residences can be constructed, purchased or inherited for their use (ibid. 185). This suggests that a *nuclear residential pattern* operates in Baghestan.

This is backed up by the fact that none of the five recently-married couples in the community reside in the natal co-residential group of either the wife or the husband. [2] Moreover, there is a clear aversion amongst married men and women across the entire community for sharing a residence with any other married adult (this occurs in only one residence).

Capileira

Delaigue specifies neolocality as the standard practice upon marriage in Capileira, with both sons and daughters departing from their natal co-residential groups and setting up independent marital homes (Delaigue 1988: 101). Although she does not provide enough information to assess the residential circumstances of newlyweds, it is notable that couples in the community express a preference for residing independently of other adults even in advanced old age (ibid. 101f.), and that there are no couples within the surveyed population who co-reside with other married adults. Taken together, these observations point to the operation of a *nuclear residential pattern*.

Denpasar

Lancret does not offer any information on the expectations of Denpasar inhabitants regarding the residential decisions of newlyweds; however, in a separate anthropological study, Peacock reports that:

> Balinese tend to reside patrilocally. The wife moves into the household of the husband, which is typically a noisy, walled compound in which dwell the husband's parents, brothers, and brothers' wives and children (Peacock 1973:101).

The above suggests that a *joint residential pattern* may operate in Denpasar, and the rest of Bali. This interpretation cannot be confirmed in the absence of more specific information about the community itself. However, some support can be found within the small sample of co-residential groups selected for analysis: a consistent aversion is evident amongst married men for co-residing with either their married daughters or their married sisters, but no equivalent aversion is evident against married sons or brothers.

Hasanabad

Watson did not elicit any statements from the inhabitants of Hasanabad about the types of living arrangements or residential decisions they consider most appropriate. However, the only wedding ceremony she witnessed involved the bride settling into the groom's parental

[2] Couples are assumed to be recently married if the husband is still in his twenties. The five recently married couples in Baghestan reside in: B1005, B1013, B1019, B1025 and B1031.

residence (H1031), which was already occupied by the groom's widowed mother and two married brothers (Watson 1979: 211), suggesting that the inhabitants may practise a *joint residential pattern*.

The residential circumstances of other newlyweds back this up. Of the 11 men married within the past five years, three quarters (73%) have retained membership of their natal co-residential groups and introduced their wives as members.[3] In addition, while co-residence is evidenced between married men and their married brothers and sons, there is a consistent aversion across the entire community for married men to share a residence with their married daughters (co-residence occurs in none of the 6 possible cases) or with their married sisters (co-residence occurs in none of the 10 possible cases).

Ibadan

Schwerdtfeger's study of the inhabitants of Ibadan led him to identify a cyclical pattern regulating the compositional development of co-residential groups in that community (Schwerdtfeger 1982: 280). The pattern he describes closely resembles the joint developmental cycle outlined in section 2.2.2, whereby every daughter is expelled from her natal co-residential group upon her marriage, while all sons are retained. It is therefore probable that a *joint residential pattern* is in operation in Ibadan.

The information he supplies is insufficient to quantify the residential circumstances of all newlyweds or to identify community-wide aversion trends. It is notable, however, that the small sample of co-residential groups selected for analysis reveals a consistent aversion amongst married men for co-residing with their married daughters or with their married sisters, but no equivalent aversion against married sons or married brothers.

Kireyka

Tobert reports the expectation amongst the inhabitants of Kireyka that, after a period of betrothal lasting up to five years (during which bride-price payments are made), a man can formally marry a woman and take her away to live wherever he wants (Tobert 1988: 150). This implies that couples live with neither the bride's nor the groom's parents. The practice of neolocality begins in Kireyka soon after betrothal is agreed, when an independent compound is built outside the future bride's parental residence to accommodate the couple during her future husband's visits (ibid. 174). Together, these facts point to the operation of a *nuclear residential pattern*.

[3] Men are assumed to have married recently if they are young and do not have any children, or if their eldest child is under the age of five (ibid. Table 2.4). The 11 recently married men in Hasanabad reside in H1008, H1011, H1012, H1017, H1018, H1028, H1031 (3 men), H1035 and H1039.

The residential circumstances of recently betrothed or newly married couples in the community confirm this pattern: none of the 11 recently-formed couples in the community have moved into the compounds of either the bride's or the groom's parents.[4]

However, a minority of these recently-formed couples (36%) have used a thorn fence to enclose their own compound with that of the bride's parents, and have thus joined the bride's natal co-residential group. Multi-conjugal living arrangements occur in Kireyka only around the time that a girl is betrothed, and seem to be designed to offer communal shelter to the goats she and her family receive as bride price (Tubiana 1985: 290).[5] Since this occurs selectively, and is a short-lived phenomenon dissolved soon after the new couple's wedding ceremony,[6] all cases of multi-conjugal occupancy should be viewed as expedient deviations in the operation of the nuclear pattern.

Marrakech

Schwerdtfeger proposed that a cyclical pattern regulates the compositional development of co-residential groups in Marrakech (Schwerdtfeger 1982: 39-41). The pattern he describes resembles the joint developmental cycle outlined in section 2.2.2, suggesting the operation of a *joint residential pattern* in Marrakech, in which daughters are normally expelled from their natal co-residential groups upon their marriage while all sons retain membership for life, bringing in their spouses and incorporating their families of procreation.

There is insufficient data available to assess the residential circumstances of newlyweds or identify aversion trends across the community, but within the small sample of co-residential groups selected for analysis there are indications that married men are averse to co-residing with their married sisters (no cases), and possibly also their married daughters (this occurs only twice).

[4] The new couples reside in: K1008, K1015, K1030 (2 cases), K1020, K1025 (2 cases), K1028, K1029 K1039, and K1047.

[5] Thus, all the future or recent brides in Kireyka who own flocks (i.e. those residing in K1008, K1015, K1020, K1025, K1030 and K1039) also have thorn fences extending between their own compound and that of a relative. The three betrothed or recently married women who do not own flocks have not linked their compounds to a relative's compound. In the case of the sisters in K1028 and K1029, their brother immediately claimed the animals they received as bride-price and used them to pay for his own wedding (Tobert 1988: 247); in the case of K1047, the bride-price was paid in cash rather than animals (ibid. 148).

[6] Of the four cases where compounds have been linked together, none has lasted for more than four years (see Appendix C for construction dates). The brides in K1015 and K1008 had their weddings within 1984, the year of Tobert's fieldwork (Tobert 1988: 175), and we can assume that the fences around their compounds will soon be removed. Wedding dates for the recent brides in K1030 are not given by Tobert.

Anegondi

Tobert reports that it is customary after a marriage in Anegondi for a bride to move to her husband's household (Tobert 2000: 40). This statement implies that women are not entitled to life-long membership of their natal co-residential groups, whereas men are, and are expected to introduce their spouses. The inhabitants of Anegondi may therefore practise a *joint residential pattern*.

The data provided by Tobert does not allow us to assess the residential circumstances of newlyweds in Anegondi or to quantify aversion trends across the whole community. Amongst the surveyed population, however, most married men seem averse to co-residing with their married daughters (this occurs only three times) and their married sisters (this occurs only once), while showing no equivalent aversion towards their married sons or brothers.

Pobia

Trova does not offer any information on the expectations of Pobia's inhabitants regarding the residential decisions of newlyweds; however, the Encyclopaedia of World Cultures reports that, amongst Cretans, "couples usually assume independent residence at marriage" (Bennet (Ed) 1994: 70), pointing towards the practice of neolocality and the possible operation of a *nuclear residential pattern* in Pobia.

The residential circumstances of newlyweds and aversion trends across the community cannot be quantified on the basis of Trova's data. Evidence from the surveyed population nevertheless suggests that couples in Pobia are averse to co-residing with other married adults (this occurs only once).

Karapinar

Aurenche et al. do not discuss how the inhabitants of Karapinar view the co-residence of couples, nor where couples are expected to reside after they marry. In her ethnographic study of the Kurdish inhabitants of Sisin in the nearby province of Hakkari, however, Yalçin-Heckmann's reports that

> patrilineal kin-unity…[requires] sons to stay in their parental house after marriage and brothers to stay together after the death of their father…the local ideal household would have at least one married couple (Yalçin-Heckmann 1991: 150f.).

If these principals also apply to the inhabitants of Karapinar, this would suggest the operation of a *joint residential pattern*. Support for this can be found in the residential circumstances of the six recently married couples in the community: two thirds (67%) of these couples reside

in the groom's natal co-residential group.[7] In addition, there seems to be an aversion amongst married men for sharing a residence with their married daughters (this occurs only once, in a part-time arrangement) or their married sisters.

Ban Touei

Clément-Charpentier and Clément do not mention where newlyweds in Ban Touei are expected to reside. However, they do report that the youngest daughters of co-residential group heads normally remain in their natal groups to take care of their elderly parents and inherit their residence (Clément-Charpentier and Clément 1990: 259). This practice is described as typical amongst ethnic Lao groups in the Encyclopaedia of World Cultures, where reference is made to "the custodial daughter and her in-marrying husband" (Hockings (Ed) 1994: 159), implying that the favoured child is entitled to introduce her spouse into her natal group. On this basis, it is possible that a *stem residential pattern* operates in Ban Touei.

The only recently married couple living in the community in fact co-resides with the groom's parents, but as the groom is the youngest of three children (the rest of whom are married and reside independently), he may have taken on the role typically assigned to youngest daughters. In addition, there is a consistent aversion in the community for married couples to co-reside with the married siblings of either partner, as would be expected in settings where the stem residential pattern operates.

Willow Lake

Janes does not discuss the types of living arrangements or residential decisions the inhabitants of Willow Lake consider most appropriate. In a separate ethnographic study, Krech reports that the Athapaskan groups of the Arctic Drainage Lowlands are structured according to bilocal and bilateral principals (Krech 1980: 86), implying that married couples do not exhibit a tendency to reside with either the wife's or the husband's parents. From this it is possible to infer that a *nuclear residential pattern* may operate in Willow Lake. However, the only newlywed couple living in the community does not reside independently but shares a residence with the groom's parents. The remaining married couples show a consistent aversion to co-residing with any other married adult and their spouse, as would be expected in settings where a nuclear residential pattern is practised.

[7] Couples are assumed to have married recently if they have no children or just one child. Five of the recently married couples reside in: R1001, R1010, R1011, R1016, and R118A. The recently married daughter of the head of R1019 resides part-time in her natal co-residential group, but without her husband.

Xculoc

De Pierrebourg reports that the inhabitants of Xculoc adhere to principles of patrivirilocality (de Pierrebourg 1999: 49), implying the operation of a *joint residential pattern* in the community, whereby men tend to remain in their parental residences after marriage and introduce their wives and children to their natal co-residential groups.

This suggestion finds support in the residential circumstances of newlyweds in the community. Of the 12 newlywed couples in Xculoc, three quarters (75%) reside in the husband's natal co-residential group.[8] Moreover, married men across the entire community seem averse to sharing a residence with their married daughters (no occurrences) or their married sisters (only one occurrence),[9] but show no equivalent aversion to co-residing with their married sons and brothers.

[8] Couples are assumed to have married recently if they have no children or just one child. The recently married couples reside in X134S, X1036, X1019, X1030, X1031, X1016, X1027, X104N, X1005, X1009, X1014, and X1015.

[9] It is not possible to calculate how many possibilities exist for these categories of co-residence to occur in Xculoc (as it is in Aliabad or Hasanabad), because kinship relationships across the community have not been charted.

APPENDIX G
Concordance linking the Cypriot Bronze Age residences to the primary publication record

This appendix matches up the residences in this thesis with the buildings and rooms to which they correspond in published excavation reports. Table G.1 lists the 40 complete residences that were identified amongst the architectural remains of nine Cypriot Bronze Age settlements. With regards to each residence, reference is made to the phase or stratum in which the residence was found during excavation; the label the residence was assigned in the excavation report; and the page numbers in the excavation report where the residence or its individual rooms were illustrated or described.

TABLE G.1 Concordance linking the residences in the thesis to the publication record

Residence		Date of occupation	Excavation phase / stratum	Residence label in publication (if recognised as a self-contained residence in publication)	Reference to residence (if recognised as a self-contained residence in publication)	Reference to individual rooms / units in publication	
Marki	1	ECIII	Phase F	Compound 24	Frankel and Webb 2006b: Figure 11.6	L	Frankel and Webb 2006b: 45-47
	2	ECIII	Phase F	Compound 6	Frankel and Webb 2006b: Figure 3.9 Frankel and Webb 2006b: Figure 3.46 Frankel and Webb 2006b: Figure 11.6	XCIII	Frankel and Webb 2006b: 60-62
						XCIV	Frankel and Webb 2006b: 62-64
						XCVIII	Frankel and Webb 2006b: 69-70
						XCIX	Frankel and Webb 2006b: 70-72
	3	ECIII	Phase E	Compound 9	Frankel and Webb 2006b: Figure 3.9 Frankel and Webb 2006b: Figure 3.72 Frankel and Webb 2006b: Figure 11.5	CXIX	Frankel and Webb 2006b: 83-86
						CXX	Frankel and Webb 2006b: 83-86
						CXXI	Frankel and Webb 2006b: 83-86
	4	ECIII	Phase D	Compound 14	Frankel and Webb 2006b: Figure 11.4	CXI	Frankel and Webb 2006b: 64-67
						CIX	Frankel and Webb 2006b: 64-67
	5	ECIII	Phase D/E	Compound 15	Frankel and Webb 2006b: Figure 3.66 Frankel and Webb 2006b: Figure 11.4 Frankel and Webb 2006b: Figure 11.5	CXII	Frankel and Webb 2006b: 79-81
						CXIII	Frankel and Webb 2006b: 79-81
	6	MCI-II	Phase G	Compound 29	Frankel and Webb 2006b: Figure 3.8 Frankel and Webb 2006b: Figure 3.22 Frankel and Webb 2006b: Figure 11.7	IX	Frankel and Webb 2006b: 42-44
						X	Frankel and Webb 2006b: 42-44
						XIII	Frankel and Webb 2006b: 42-44
						LI	Frankel and Webb 2006b: 45-47
	7	MCI-II	Phase H	Compound 33	Frankel and Webb 2006b: Figure 3.8 Frankel and Webb 2006b: Figure 11.8	LVII	Frankel and Webb 2006b: 47-49; 1996b: 41-42
	8	MCI-II	Phase H	Compound 7	Frankel and Webb 2006b: Figure 3.7 Frankel and Webb 2006b: Figure 3.61 Frankel and Webb 2006b: Figure 11.8	C	Frankel and Webb 2006b: 73-74
						CII	Frankel and Webb 2006b: 73-74
						CV	Frankel and Webb 2006b: 73-74
						CI	Frankel and Webb 2006b: 75-76
						CIII	Frankel and Webb 2006b: 76-78
						CIV	Frankel and Webb 2006b: 75-76
	9	MCI-II	Phase F	Compound 23	Frankel and Webb 2006b: Figure 3.9 Frankel and Webb 2006b: Figure 11.6	CXXI	Frankel and Webb 2006b: 83-86

Residence		Date of occupation	Excavation phase / stratum	Residence label in publication (if recognised as a self-contained residence in publication)	Reference to residence (if recognised as a self-contained residence in publication)	Reference to individual rooms / units in publication	
Marki	10	MCI-II	Phase H	Compound 32	Frankel and Webb 2006b: Figure 3.25 Frankel and Webb 2006b: Figure 11.8	LI	Frankel and Webb 2006b: 45-47; 1996b: 39-41
						LII	Frankel and Webb 2006b: 45-47; 1996b: 39-41
	11	MCI-II	Phase H	Compound 31	Frankel and Webb 2006b: Figure 11.8	CXIII	Frankel and Webb 2006b: 79-81
Sotira	1	ECIII	*One phase identified*	-	-	1	Swiny et al. 2003: 10-15
						3	Swiny et al. 2003: 15-17
	2	ECIII	*One phase identified*	-	-	5	Swiny et al. 2003: 19-20
	3	ECIII	*One phase identified*	-	-	6	Swiny et al. 2003: 21-23
	4	ECIII	*One phase identified*	-	-	40	Swiny et al. 2003: 23-25
						7	Swiny et al. 2003: 23-25
						18	Swiny et al. 2003: 27-28
	5	ECIII	*One phase identified*	-	-	21	Swiny et al. 2003: 48-49
	6	ECIII	*One phase identified*	-	-	8	Swiny et al. 2003: 42-44
	7	ECIII	*One phase identified*	-	-	2	Swiny et al. 2003: 39-42
						25	Swiny et al. 2003: 39-42
Alambra	1	MCII	*One phase identified*	Building IV	Coleman et al. 1996: 75-93 Coleman et al. 1996: Figure 11 Coleman et al. 1996: Figure 22	8	Coleman et al. 1996: 85-91
						6	Coleman et al. 1996: 83-85
						13	Coleman et al. 1996: 79-83
						23	Coleman et al. 1996: 78-79
						27	Coleman et al. 1996: 91-93
	2	MCII	*One phase identified*	Building I	Coleman et al. 1996: 33-47 Coleman et al. 1996: Figure 11 Coleman et al. 1996: Figure 16	2	Coleman et al. 1996: 42-44
						2'	Coleman et al. 1996: 44-46
						3	Coleman et al. 1996: 39-41
						5	Coleman et al. 1996: 46-47
						7	Coleman et al. 1996: 37-39

Residence		Date of occupation	Excavation phase / stratum	Residence label in publication (if recognised as a self-contained residence in publication)	Reference to residence (if recognised as a self-contained residence in publication)	Reference to individual rooms / units in publication	
Alambra	3	MCII	*One phase identified*	Building II	Coleman et al. 1996: 47-60 Coleman et al. 1996: Figure 11 Coleman et al. 1996: Figure 18	1	Coleman et al. 1996: 57-59
						1'	Coleman et al. 1996: 53-57
						4	Coleman et al. 1996: 51-53
	4	MCII	*One phase identified*	Building III	Coleman et al. 1996: 60-74 Coleman et al. 1996: Figure 11 Coleman et al. 1996: Figure 20	9	Coleman et al. 1996: 70-73
						10	Coleman et al. 1996: 67-68
						11	Coleman et al. 1996: 66-67
						12	Coleman et al. 1996: 65-66
						19	Coleman et al. 1996: 68-70
						20	Coleman et al. 1996: 63-64
Enkomi	1	LCIIC	Level IIB	Fortress West Sector (B)	Dikaios 1969-71: Plate 251	87	Dikaios 1969-71: 56
						84/85	Dikaios 1969-71: 57
						70	Dikaios 1969-71: 60
						30	Dikaios 1969-71: 60-61
						29	Dikaios 1969-71: 61
						88	Dikaios 1969-71: 61
	2	LCIIC	Level IIB	Fortress, west part of Central Sector (A)	Dikaios 1969-71: Plate 251	3A/B/C	Dikaios 1969-71: 47-49
						2A/B/C	Dikaios 1969-71: 47, 50
						32A/B	Dikaios 1969-71: 49
						33	Dikaios 1969-71: 50
						13/13A	Dikaios 1969-71: 47, 54
						11	Dikaios 1969-71: 52
						12/12A/41	Dikaios 1969-71: 53
						20	Dikaios 1969-71: 53-54
						19	Dikaios 1969-71: 54
						16	Dikaios 1969-71: 54
						21	Dikaios 1969-71: 55
						26/27	Dikaios 1969-71: 55
						5	Dikaios 1969-71: 55-56

Residence		Date of occupation	Excavation phase / stratum	Residence label in publication (if recognised as a self-contained residence in publication)	Reference to residence (if recognised as a self-contained residence in publication)	Reference to individual rooms / units in publication	
Enkomi	3	LCIIC	Level IIB	Fortress, east part of Central Sector (A)	Dikaios 1969-71: Plate 251	1	Dikaios 1969-71: 51
						34/35/58/ 59/60	Dikaios 1969-71: 51
						60	Dikaios 1969-71: 52
						59	Dikaios 1969-71: 52
						35	Dikaios 1969-71: 52
						34	Dikaios 1969-71: 52
						49	Dikaios 1969-71: 52
						40	Dikaios 1969-71: 53
	4	LCIIC	Level IIB	Fortress, west part of East Sector (D)	Dikaios 1969-71: Plate 251	42	Dikaios 1969-71: 62
						47	Dikaios 1969-71: 62-63, 64
						45	Dikaios 1969-71: 63
						46	Dikaios 1969-71: 63
						52	Dikaios 1969-71: 64
						51	Dikaios 1969-71: 64
Kalavasos	1	LCIIC	*Not labelled*	Building Complex II	South et al. 1989: Figure 2 South 1980: 35-38	26	South 1980: 35-37
						27	South 1980: 37
						28	South 1980: 37
						29	South 1980: 37
						30	South 1980: 37-38
						31	South 1980: 38
Pyla	1	LCIIC	*One phase identified*	Complex C	Karageorghis and Demas 1981: Fig 4 Karageorghis and Demas 1981: 12-15	18/20	Karageorghis and Demas 1981: 14, 15
						19	Karageorghis and Demas 1981: 13-14
						21	Karageorghis and Demas 1981: 13
						17	Karageorghis and Demas 1981: 12-13
						33	Karageorghis and Demas 1981: 13
						32	Karageorghis and Demas 1981: 14
						12	Karageorghis and Demas 1981: 14
						27	Karageorghis and Demas 1981: 14

Residence		Date of occupation	Excavation phase / stratum	Residence label in publication (if recognised as a self-contained residence in publication)	Reference to residence (if recognised as a self-contained residence in publication)	Reference to individual rooms / units in publication	
Pyla	2	LCIIC	*One phase identified*	Complex B	Karageorghis and Demas 1981: Fig 4 Karageorghis and Demas 1981: 9-12	5	Karageorghis and Demas 1981: 11 Dikaios 1969-71: 903
						9	Karageorghis and Demas 1981: 10 Dikaios 1969-71: 903-4
						101	Karageorghis and Demas 1981: 10-11
						11	Karageorghis and Demas 1981: 10, 14
						13	Karageorghis and Demas 1981: 9-10
						14	Karageorghis and Demas 1981: 10
						15/16	Karageorghis and Demas 1981: 11-12
						22	Karageorghis and Demas 1981: 11-12
	3	LCIIC	*One phase identified*	Complex A	Karageorghis and Demas 1981: Fig 4 Dikaios 1969-71: 900-905 Karageorghis and Demas 1981: 7-9	2	Karageorghis and Demas 1981: 9 Dikaios 1969-71: 903
						3	Karageorghis and Demas 1981: 8 Dikaios 1969-71: 903
						4	Karageorghis and Demas 1981: 8 Dikaios 1969-71: 903
						6	Karageorghis and Demas 1981: 8 Dikaios 1969-71: 903
						7	Karageorghis and Demas 1981: 7-8 Dikaios 1969-71: 902-903
						8	Karageorghis and Demas 1981: 8 Dikaios 1969-71: 903
	4	LCIIC	*One phase identified*	Complex D	Karageorghis and Demas 1981: Fig 4 Karageorghis and Demas 1981: 16-18	1	Karageorghis and Demas 1981: 16 Dikaios 1969-71: 903
						23	Karageorghis and Demas 1981: 17
						24	Karageorghis and Demas 1981: 16-17
						25	Karageorghis and Demas 1981: 17
						26	Karageorghis and Demas 1981: 17-18
						28	Karageorghis and Demas 1981:18

Residence		Date of occupation	Excavation phase / stratum	Residence label in publication (if recognised as a self-contained residence in publication)	Reference to residence (if recognised as a self-contained residence in publication)	Reference to individual rooms / units in publication	
Hala Sultan Tekke	1	LCIIIA	*Not labelled*	Building A	Åström et al. 2001: Figure 1 Åström et al. 1983: Figure 3	1	Hult 1978: 18-19
						2	Hult 1978: 19
						3	Hult 1978: 19-20
						4	Hult 1978: 20
						7	Hult 1981: 7
						10	Hult 1981: 7
	2	LCIIIA	*Not labelled*	Building B	Åström et al. 2001: Figure 1 Åström et al. 1983: Figure 3	5/6/8	Hult 1981: 17
						9	Hult 1981: 7
						12/13/43	*None*
	3	LCIIIA	*Not labelled*	Building F	Åström et al. 2001: Figure 1 Åström et al. 1983: Figure 3	41	Åström et al. 1983: 169-185
						42/44/45/ 46/47/57	*None*
Kourion	1	LCIIIA	Stratum E	House A.V	Weinberg 1983: Figure 5 Weinberg 1983: 11-13, 19-20	1	Weinberg 1983: 12, 19
						2	Weinberg 1983: 12, 20
						3	Weinberg 1983: 12-13, 20
						4	Weinberg 1983: 12-13, 19-20
						5	Weinberg 1983: 12-13, 19
	2	LCIIIA	Stratum E	House A.VI	Weinberg 1983: Figure 9 Weinberg 1983: 13-15, 20-22	1	Weinberg 1983: 14
						2	Weinberg 1983: 14, 20-22
						3	Weinberg 1983: 14, 20-22
						4	Weinberg 1983: 14, 21-22
						5	Weinberg 1983: 14, 20-22
						6	Weinberg 1983: 14, 22
	3	LCIIIA	Stratum E	House A.VIII	Weinberg 1983: Figure 10 Weinberg 1983: 22-26	1	Weinberg 1983: 23
						2	Weinberg 1983: 23
						3	Weinberg 1983: 23-24
						4	Weinberg 1983: 24-25
						5	Weinberg 1983: 25

Residence		Date of occupation	Excavation phase / stratum	Residence label in publication (if recognised as a self-contained residence in publication)	Reference to residence (if recognised as a self-contained residence in publication)	Reference to individual rooms / units in publication	
Maa	1	LCIIIA	Floor I	-	-	19A	Karageorghis and Demas 1988: 70
						20A	Karageorghis and Demas 1988: 70
	2	LCIIIA	Floor I	-	-	56	Karageorghis and Demas 1988: 78
						57	Karageorghis and Demas 1988: 78
						58	Karageorghis and Demas 1988: 77
						60A	Karageorghis and Demas 1988: 77
						62	Karageorghis and Demas 1988: 78
	3	LCIIIA	Floor I	Building II	Karageorghis and Demas 1988: Fig 4	64A	Karageorghis and Demas 1988: 76
						65A	Karageorghis and Demas 1988: 76
						66A	Karageorghis and Demas 1988: 76
						68A	Karageorghis and Demas 1988: 76
						67	Karageorghis and Demas 1988: 75-76
						69	Karageorghis and Demas 1988: 76

APPENDIX H
Plans of the Cypriot Bronze Age settlements

This appendix presents plans of the nine Cypriot Bronze Age settlements where complete residences have been identified. Two plans are shown for each site: a plan of all the walls that have been uncovered at the site, and a separate close-up showing the position of the identified residences.

The overall site plans represent palimpsests of rooms in use at different times rather than single occupational phases, which would be difficult to isolate.[10] No conjectural walls have been reconstructed either in or around the 40 residences, but any walls that overlie or underlie them have been removed in order to clarify their layouts. Wherever possible, the illustrations give an idea of the local topography of the sites.[11] Areas where excavation has not exposed floor surfaces are also indicated. For ease of comparison, the site plans are drawn to the same scale as the plans of settlements in the ethnographic sample(see Appendix B).

The close-ups show the locations of the residences that have been identified amongst the remains. These appear in silhouette within their trenches. The internal walls of the residences can be seen in Figures 8.3 and 8.4 in Chapter 8.

[10] The ashlar building and other structures belonging to the first construction phase at Maa-*Paleokastro* ('Floor II') are not included in the plan of Maa, as they seem to have functioned as communal or special-purpose 'public' complexes rather than residences (Karageorghis and Demas 1988: 262).
[11] Some of the 1m contour-lines in the settlement plans have been extrapolated from, or interpolated between, contours in published topographical maps.

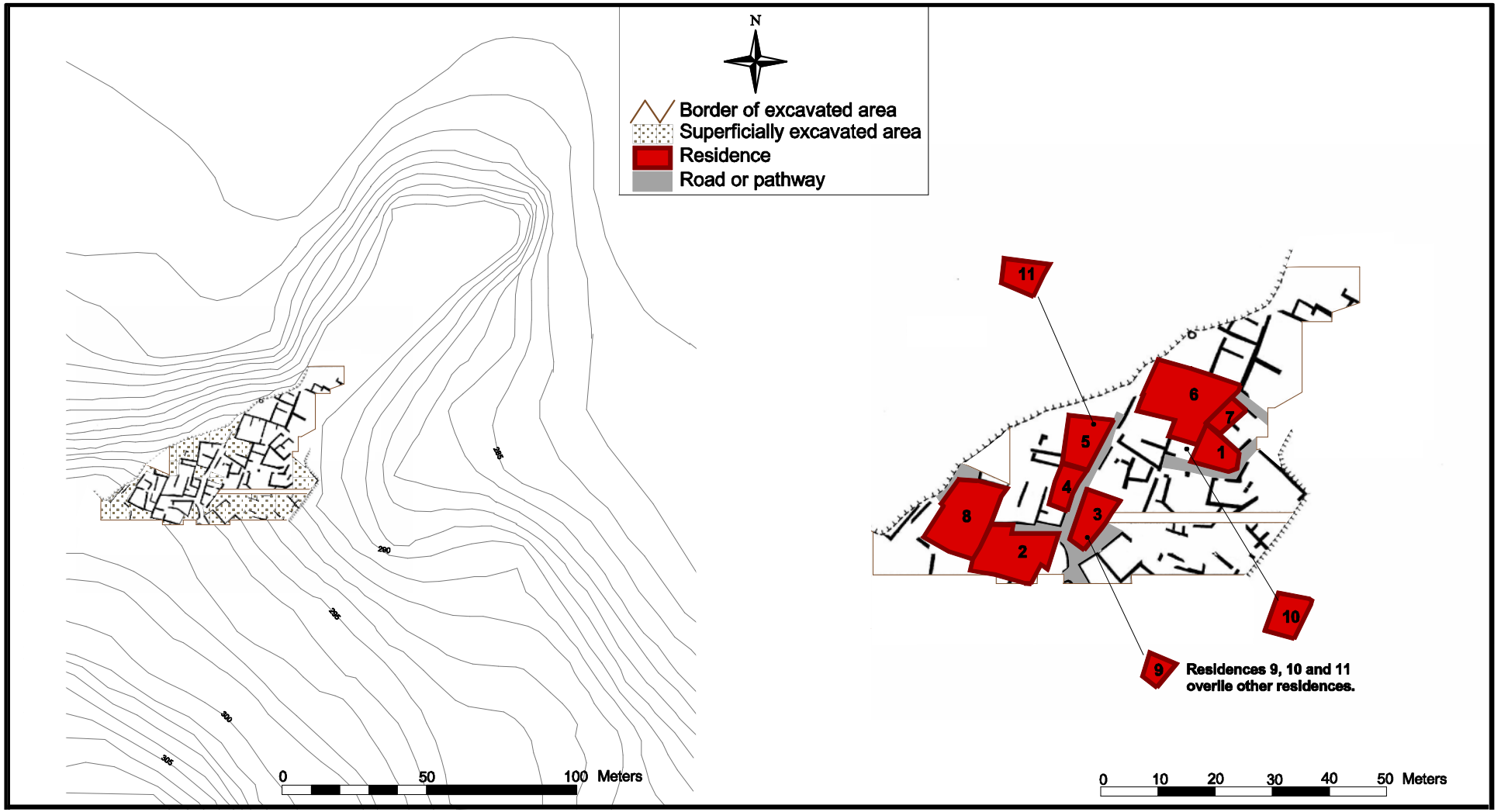


FIGURE H.1 Archaeological site of Marki-Alonia (left) and the residences identified amongst its architectural remains (right).
(Sources: Frankel and Webb 1996a; 1996b; 1997; 1999; 2000; 2006)

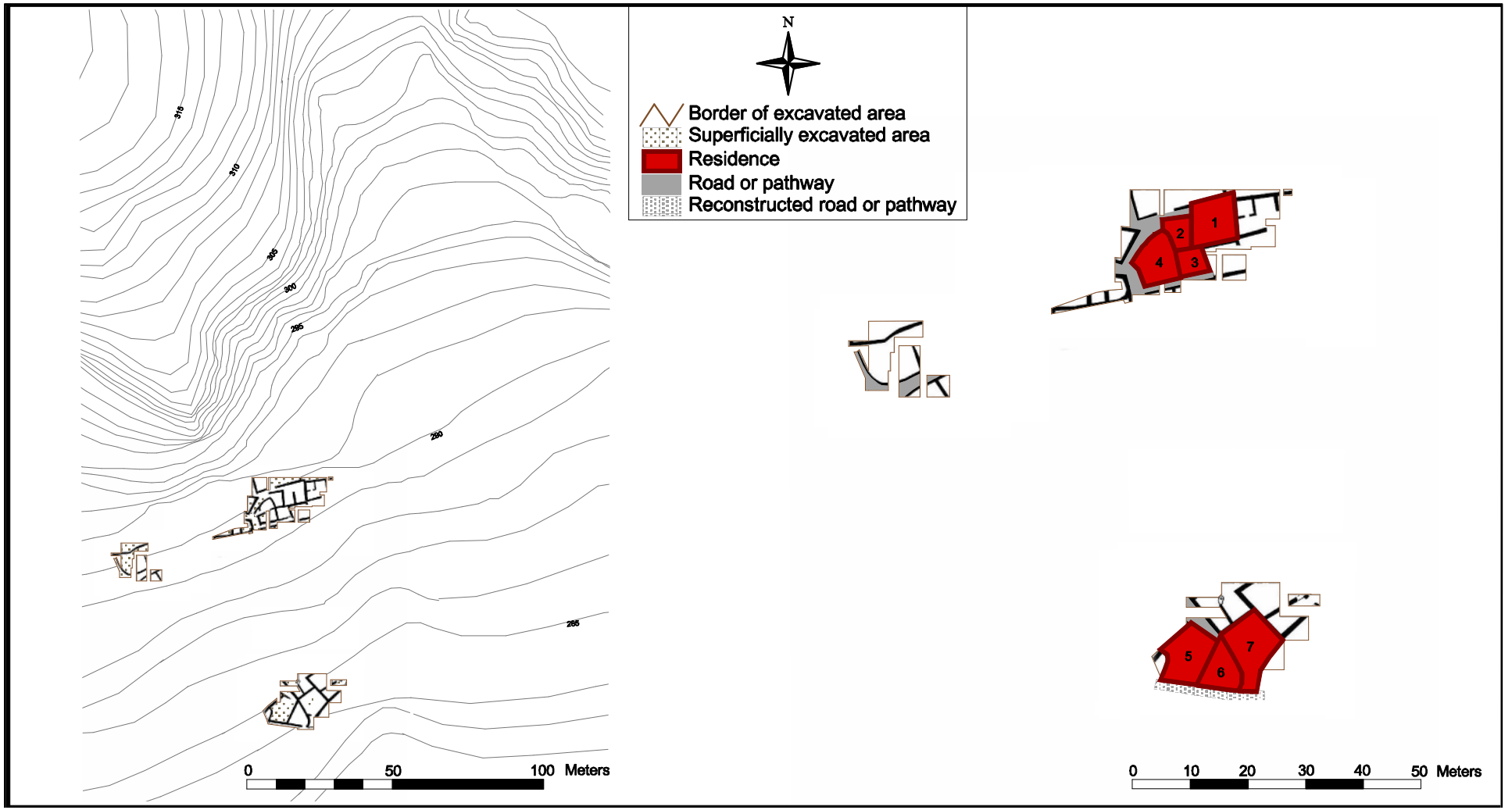


FIGURE H.2 Archaeological site of Sotira-Kaminoudhia (left) and the residences identified amongst its architectural remains (right).
Note: walls and rooms excavated since 2003 are not shown here. (Sources: Swiny 1985; Swiny et al. 2003; Swiny 2008)

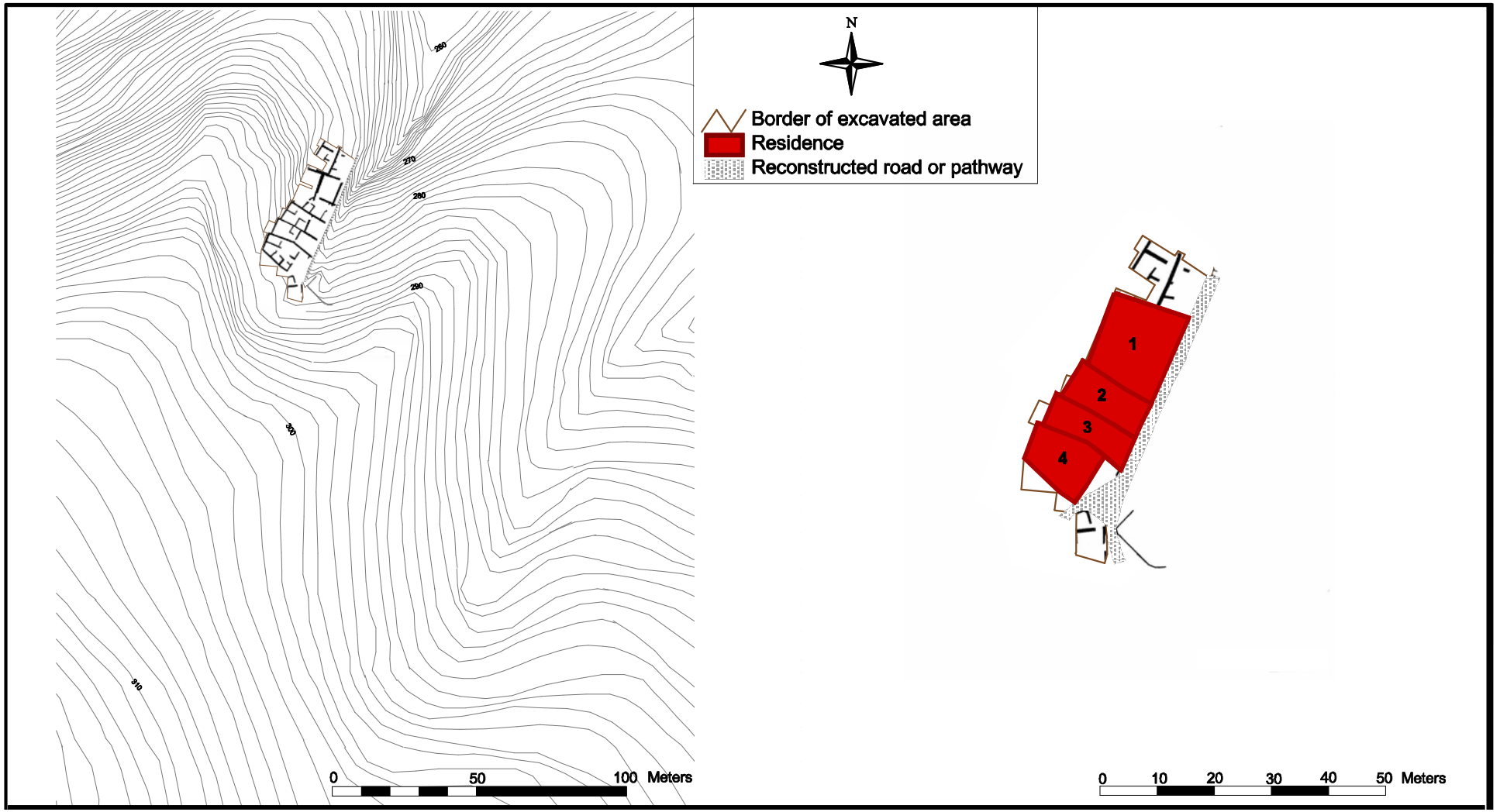


FIGURE H.3 Archaeological site of Alambra-Mouttes (left) and the residences identified amongst its architectural remains (right).
(Sources: Gjerstad 1926: 19-27; Coleman and Barlow 1979; Coleman 1985; Coleman et al. 1996)

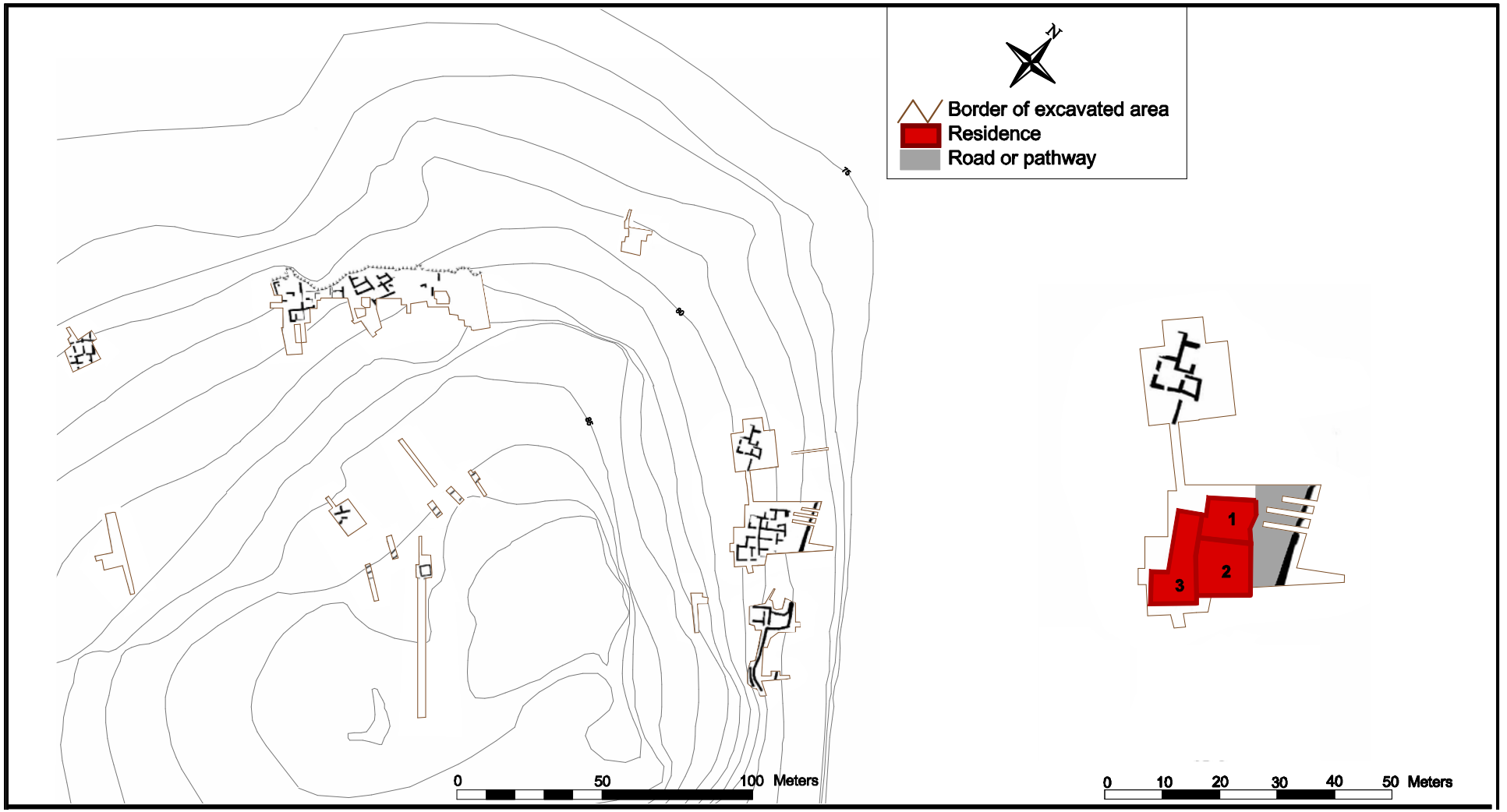


FIGURE H.4 Archaeological site of Kourion-Bamboula (left) and the residences identified amongst its architectural remains (right).
(Sources: Weinberg 1952; 1982; 1983; Benson 1969; 1970; 1982)

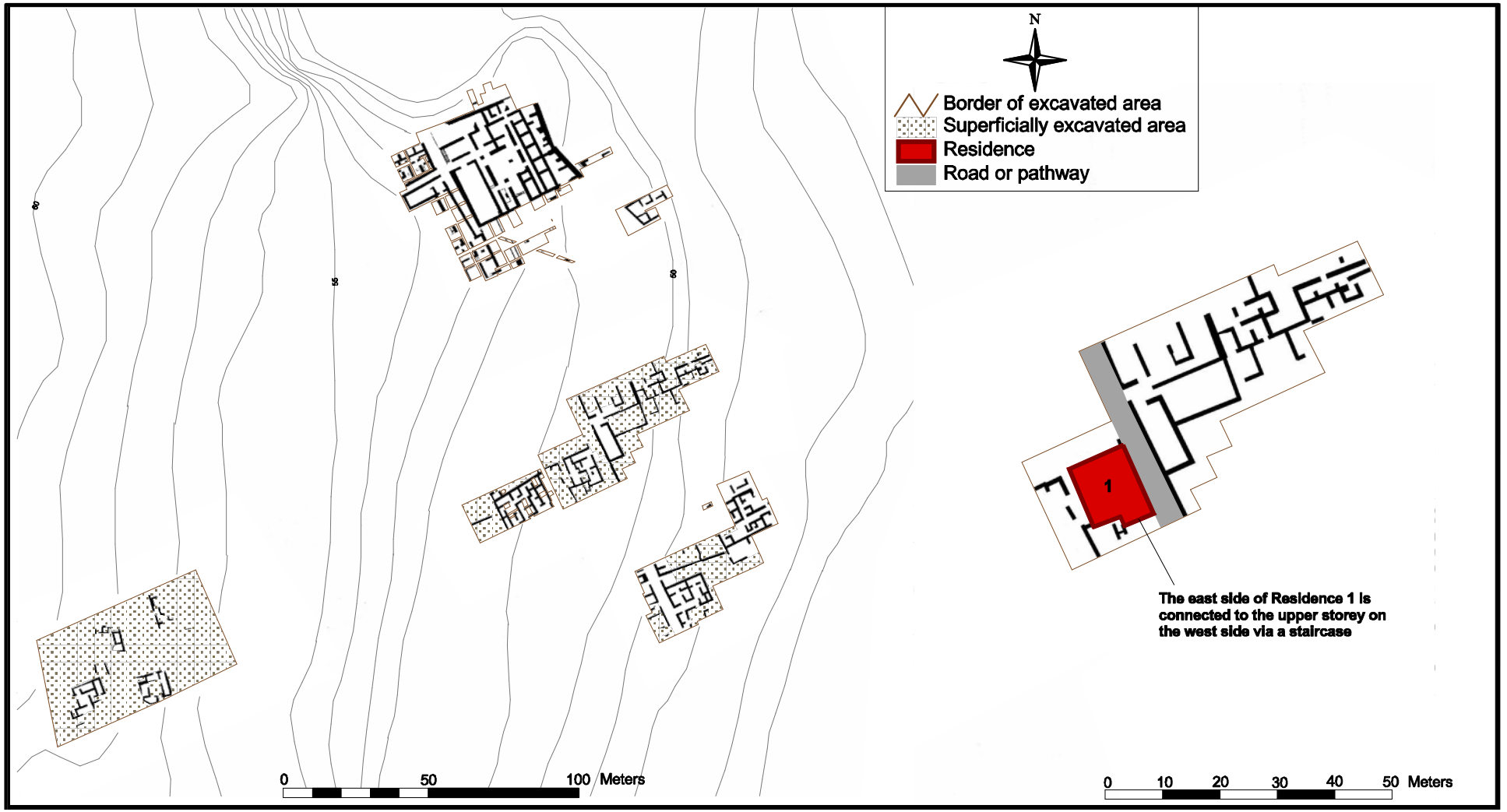


FIGURE H.5 Archaeological site of Kalavasos-Ayios Dhimitrios (left) and the single residence identified amongst its architectural remains (right)
(Sources: South 1980; 1982; 1983; 1984a; 1984b; 1988; 1991; 1992; 1996; 1997; South et al. 1989)

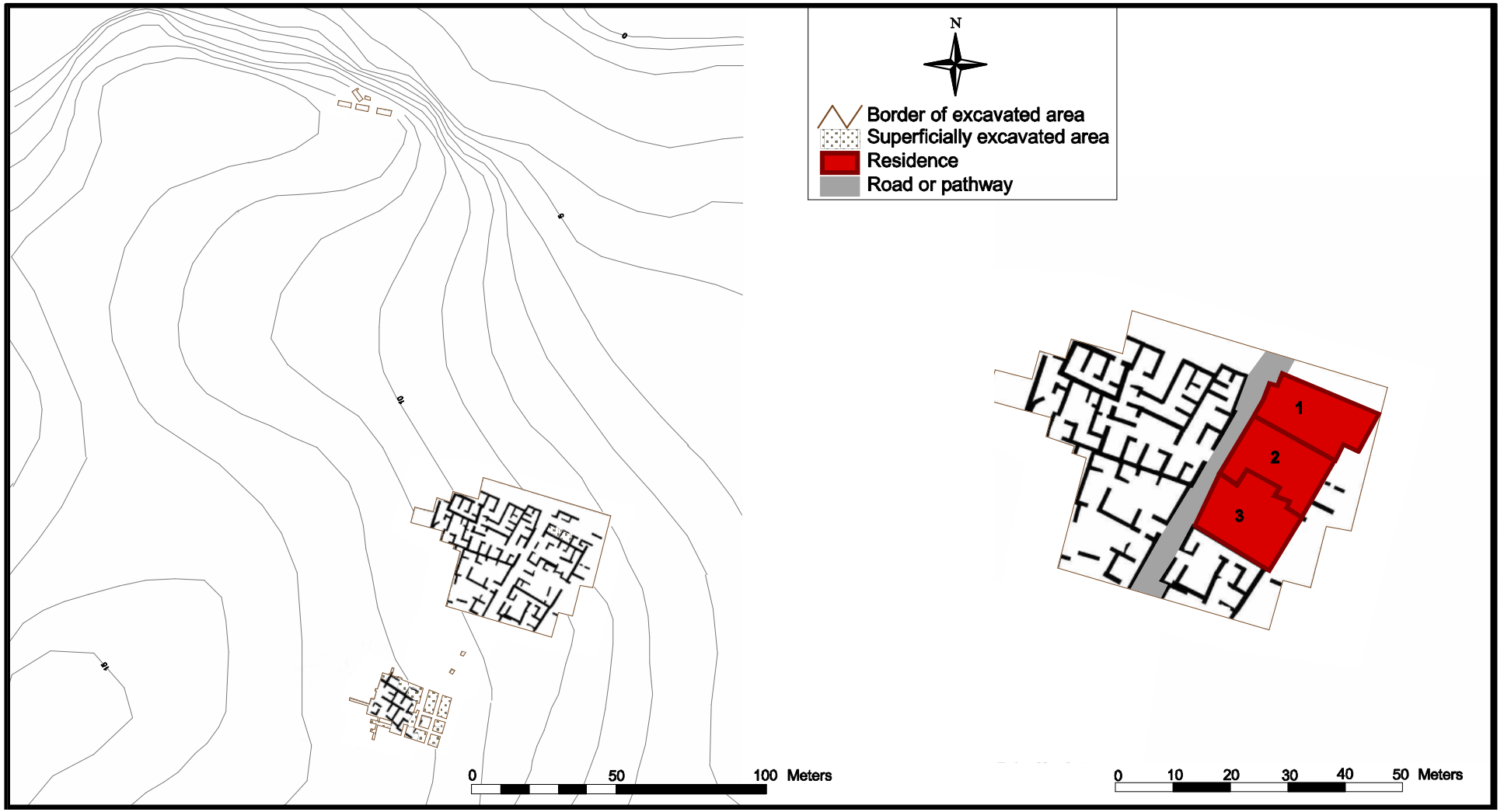


FIGURE H.6 Archaeological site of Hala Sultan Tekke-Vyzaja (left) and the residences identified amongst its architectural remains (right).
(Sources: Hult 1978; 1981; Obrink 1979; Astrom 1983; 1985; 1986; Karageorghis 1980; 1981; 1982; 1983; 1984; 1988; 1989; Christou 1992; 1993; 1994; 1995; 1996; 1997; Webb 1999: 127ff.)

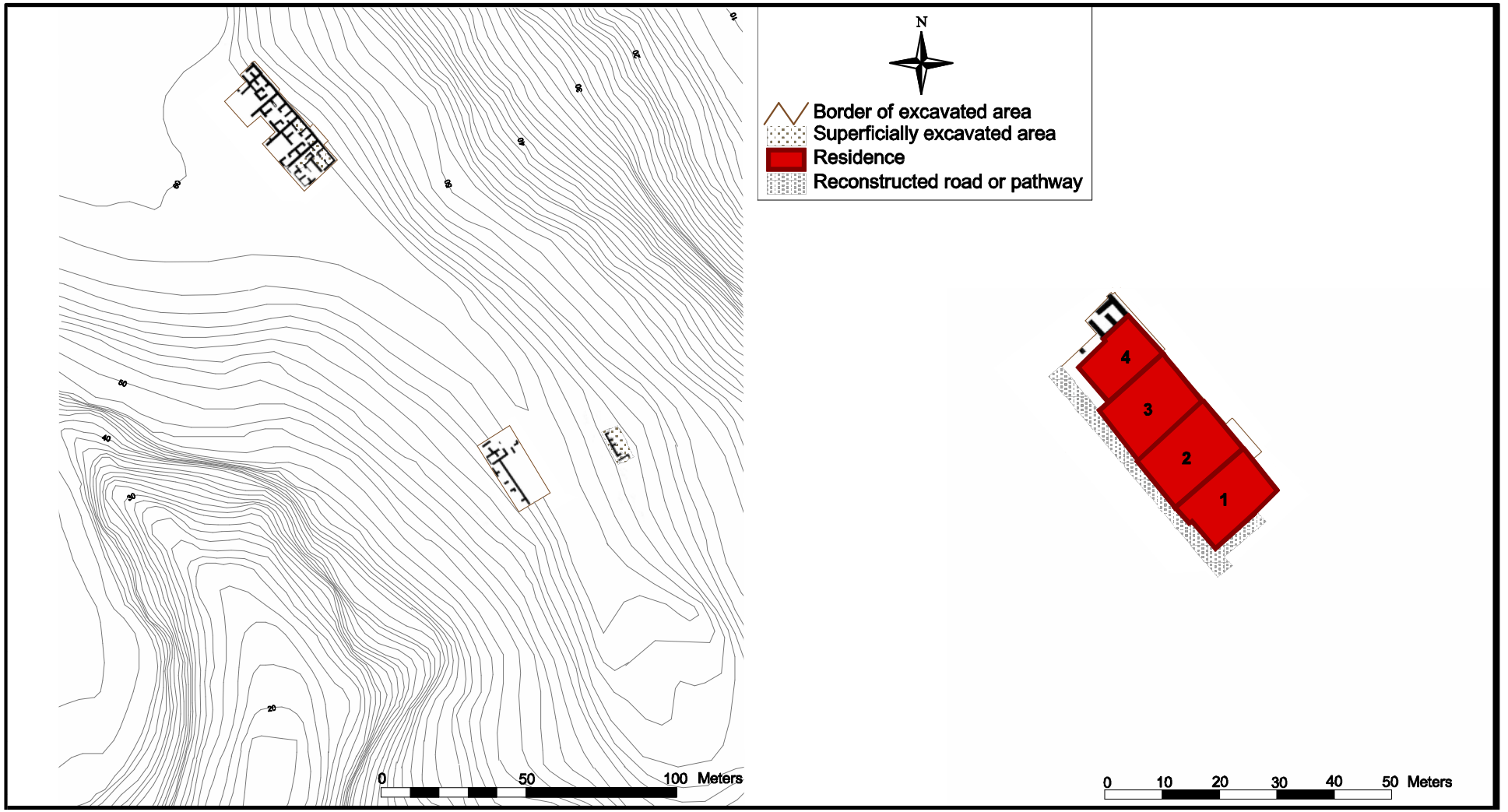


FIGURE H.7 Archaeological site of Pyla-Kokkinokremos (left) and the residences identified amongst its architectural remains (right).
(Sources: Dikaios 1969-71: 896-907; Karageorghis and Demas 1981; 1984)

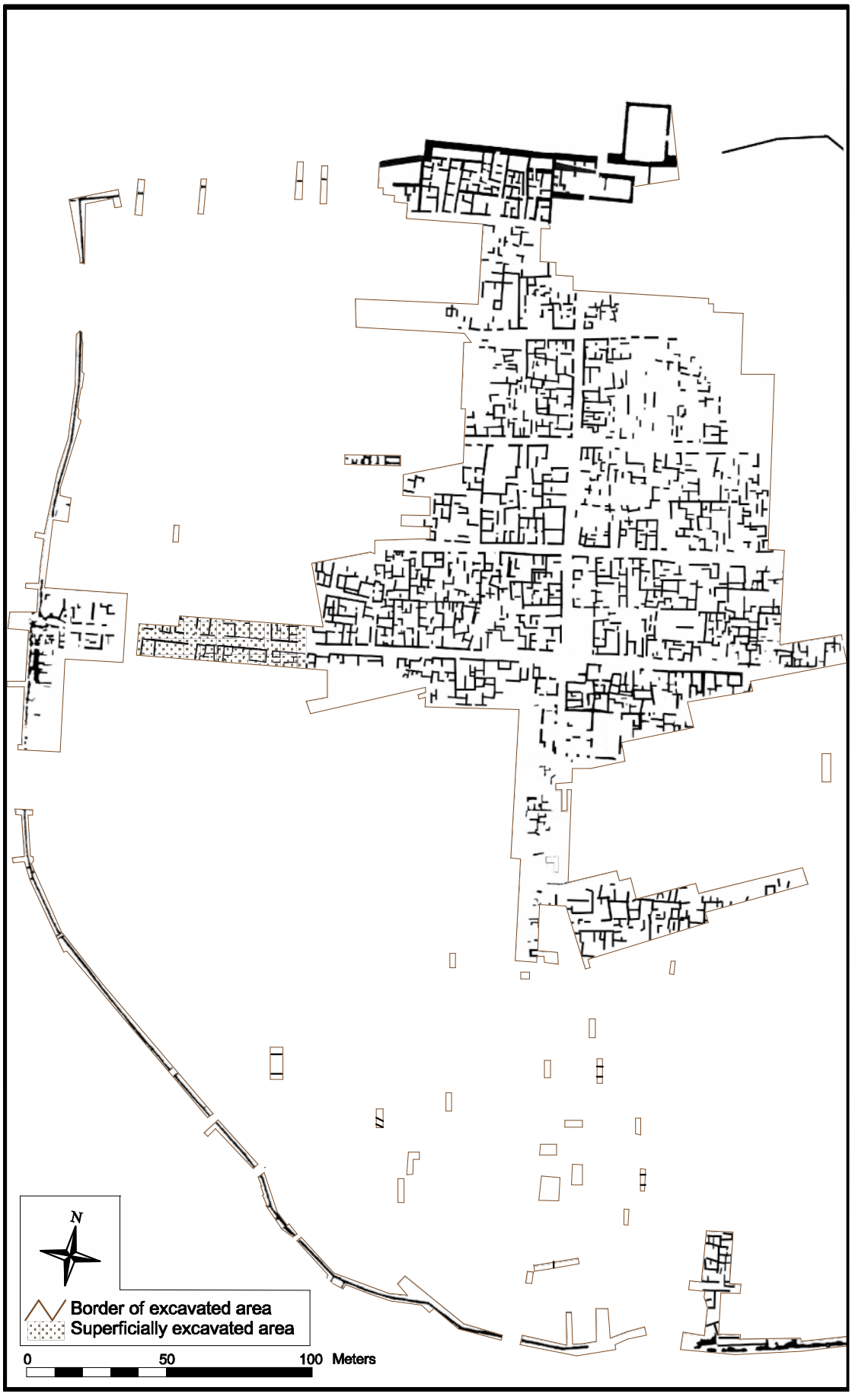


FIGURE H.8 Archaeological site of Enkomi-Ayios Iakovos.

(Sources: Dikaios 1969-71; Schaeffer 1971; Courtois et al. 1986; Karageorgis 1971; 1972; 1973)

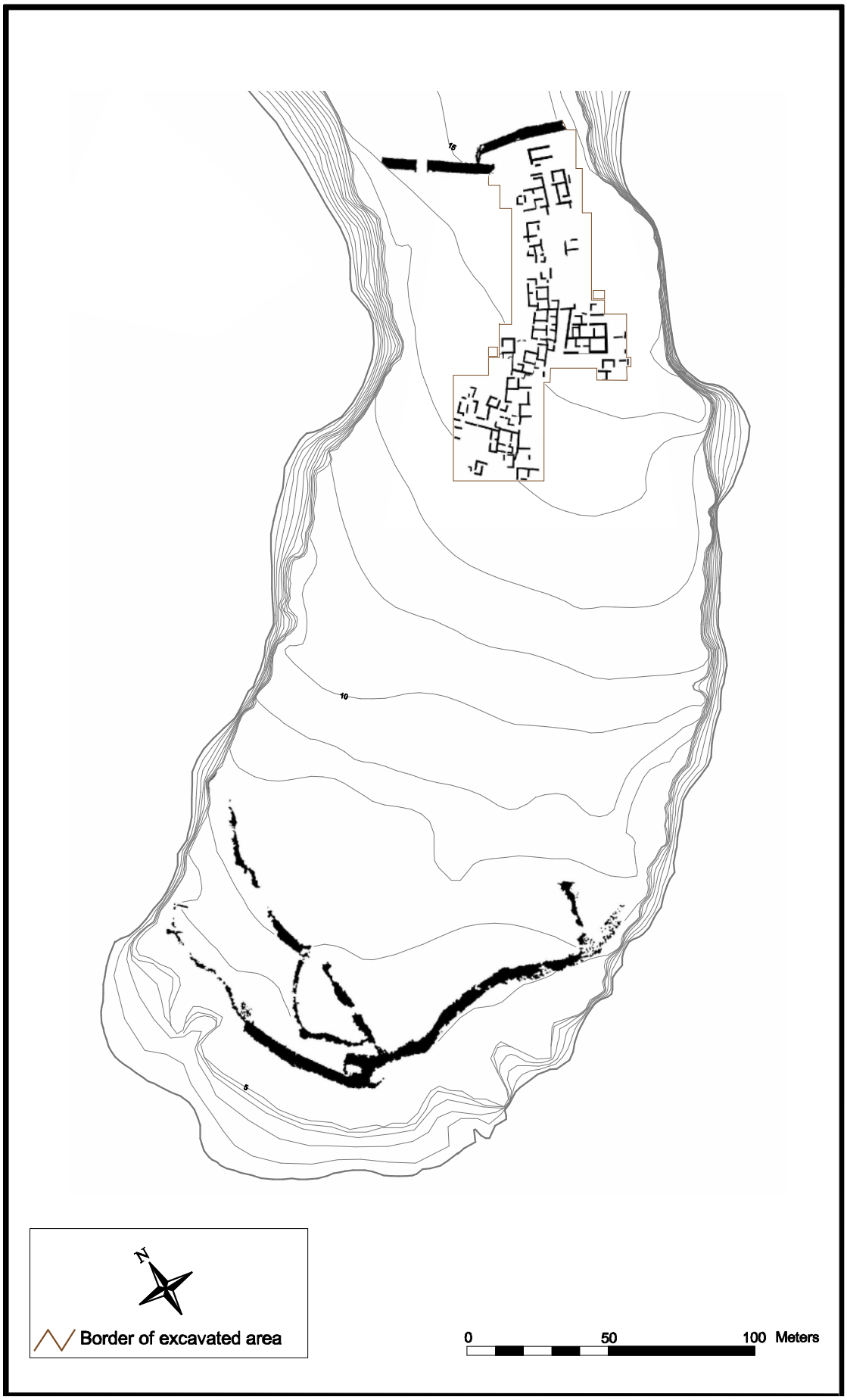


FIGURE H.9 Archaeological site of Maa-Paleokastro.

(Sources: Dikaios 1969-71: 907-912; Karageorghis et al. 1982; Karageorghis and Demas 1988)

FIGURE H.10 Residences identified amongst the architectural remains of Enkomi-Ayios Iakovos 'Level IIB' (left) and Maa-Paleokastro 'Floor 1/1A' (right).

BIBLIOGRAPHY

Allart, P. and M.-C. Delaigue. 1984. "Évolution d'un village de l'Alpujarra (Espagne): Capileira." In *Nomades et Sédentaires: Perspectives Ethnoarchéologiques*, edited by O. Aurenche, pp. 81-95. Paris: Maison de l'Orient.

Allison, P. M. 1999a. *The Archaeology of Household Activities.* London: Routledge.

Allison, P. M. 1999b. "Introduction." In *The Archaeology of Household Activities*, edited by P. M. Allison, pp. 1-18. London: Routledge.

Allison, P. M. 2004. Pompeian *Households. An Analysis of the Material Culture*. Los Angeles: Cotsen Institute of Archaeology at University of California, Los Angeles.

Anderson, M. 1971. *Family Structure in Nineteenth Century Lancashire*. Cambridge: Cambridge University Press.

Andrews, J. 2005. *The development of Roman urban and domestic space: houses and upper floors at Herculaneum*. London: Birkbeck College.

Antoniadou, S. 2005. "The impact of trade on Late Cypriot society: a contextual study of imports from Enkomi." In *Archaeological Perspectives on the Transmission and Transformation of Culture in the Eastern Mediterranean*, edited by J. Clark, pp. 66-77. Oxford: Council for British Research in the Levant and Oxbow Books.

Arcury, T. A. 1984. "Household composition and economic change in a rural community, 1900-1980: testing two models." *American Ethnologist* 11(4): 677-98.

Åström, P. 1985. "Hala Sultan Tekke." In *Archaeology in Cyprus 1960-1985*, edited by V. Karageorghis. Nicosia: A.G. Leventis Foundation.

Åström, P. 1986. "Hala Sultan Tekke - an international harbour town of the Late Cypriot Bronze Age." *Opuscula Atheniensia* XVI(1): 7-17.

Åström, P. 1989. *Hala Sultan Tekke 9 (Trenches 1972-1987 with an Index for Volumes 1-9).* Göteborg: Paul Åströms Förlag.

Åström, P. 1998. *Hala Sultan Tekke 10 (The Wells)*. Jonsered: Paul Åströms Förlag.

Åström, P., E. Åström, A. Hatziantoniou, A. Niklassen, and U. Öbrink. 1983. *Hala Sultan Tekke 8 (Excavations 1971-1979)*. Göteborg: Paul Åströms Förlag.

Aurenche, O., M. Bazin, and S. Sadler. 1997. *Villages Engloutis. Enquête Ethnoarchéologique à Cafer Höyük (Vallée de l'Euphrate)*. Lyon: Maison de l'Orient méditerranéen.

Bagnall, R. S. and B. W. Frier. 1994. *The Demography of Roman Egypt*. Cambridge: Cambridge University Press.

Barlow, J. A., D. L. Bolger, and B. Kling. 1991. *Cypriot Ceramics: Reading the Prehistoric Record*. University Museum Monograph 74. Philadelphia: The A.G. Leventis Foundation and The University Museum, Pennsylvania.

Befu, H. 1968a. "Ecology, residence and authority: the corporate household in central Japan." *Ethnology* 7(1): 25-42.

Befu, H. 1968b. “Origin of large households and duolocal residence in central Japan.” *American Anthropologist* 70(2): 309-19.

Behar, R. 1986. *Santa Maria del Monte: The Presence of the Past in a Spanish Village*. Princeton: Princeton University Press.

Behar, R. and D. Frye. 1988. “Property, progeny, and emotion: family history in a Leonese village.” *Journal of Family History* 13(1): 13-32.

Belgiorno, M. R. 1999. “Preliminary report on Pyrgos excavations 1996, 1997.” *Report of the Department of Antiquities, Cyprus*: 71-80.

Belgiorno, M. R. 2000. “Project "Pyrame" 1998-1999: archaeological. metallurgical and historical evidence at Pyrgos (Limassol).” *Report of the Department of Antiquities*, Cyprus: 1-17.

Bell, C. 2005. *The Influence of Economic Factors on Settlement Continuity Across the Late Bronze Age Transition on the Northern Levant Littoral*. Unpublished PhD Thesis. London: University of London.

Bender, D. R. 1967. “A refinement of the concept of household: families, co-residence, and domestic functions.” *American Anthropologist* 69: 493-504.

Bennett, L. A. 1994. *Encyclopaedia of World Cultures Volume IV. Europe (Central, Western, and Southeastern Europe).* London: Prentice Hall Int.

Benson, J. L. 1969. “Bamboula at Kourion: the stratification of the settlement.” *Report of the Department of Antiquities, Cyprus*: 1-28.

Benson, J. L. 1970. “Bamboula at Kourion: the stratification of the settlement.” *Report of the Department of Antiquities, Cyprus*: 25-74.

Benson, J. L. 1982. “Episkopi Bamboula: Late Bronze Age city and cemetery.” In *An Archaeological Guide to the Ancient Kourion Area and the Akrotiri Peninsula*, edited by H. W. Swiny, pp. 38-45. Nicosia: Department of Antiquities.

Berkner, L. K. 1972. “The stem family and the developmental cycle of the peasant household: an eighteenth-century Austrian example.” *The American Historical Review* 77(2): 398-418.

Berkner, L. K. 1975. “The use and misuse of census data for the historical analysis of family structure.” *Journal of Interdisciplinary History* 5: 721-38.

Berreman, G. D. 1975. “Himalayan polyandry and the domestic cycle.” *American Ethnologist* 2(1): 127-38.

Blanton, R. E. 1994. *Houses and Households: a Comparative Study*. New York: Plenum Press.

Bolger, D. L. 1996. “Figurines, fertility, and the emergence of complex society in prehistoric Cyprus.” *Current Anthropology* 37.2: 365-73.

Bongaarts, J. 1983. “The formal demography of families and households: an overview.” *IUSSP Newsletter* 17(January-April): 27-42.

Bongaarts, J. 2001. “Household size and composition in the Developing World in the 1990s.” *Population Studies* 55(3): 263-79.

Bongaarts, J., T. K. Burch, and K. W. Wachter. 1987. *Family Demography: Methods and their Application*. Oxford: Clarendon Press.

Bourdieu, P. 1977. *Outline of a Theory of Practice*. Cambridge: Cambridge University Press.

Bradley, K. 1991. *Discovering the Roman Family: Studies in Roman Social History*. New York: Oxford University Press.

Bradley, K. 2000. “Fictive families: family and household in the "Metamorphoses" of Apuleius.” *Phoenix* 54(3/4): 282-308.

Broude, G. J. and S. J. Greene. 1983. “Cross-cultural codes on husband-wife relationships.” *Ethnology* 22: 263-80.

Brown, B. M. 1987. “Population estimation from floor area: a restudy of "Naroll's constant".” *Behavior Science Research* 21: 1-49.

Burch, T. K. 1979. “Household and family demography: a bibliographic essay.” *Population Index* 45(2): 173-95.

Burch, T. K. and M. B. J. 1987. “Household formation in developed societies.” *Population and Development Review* 13(3): 495-511.

Burgel, G. 1965. *Pobia. Etude géographique d'un village Crétois*. Athens: Centre des sciences sociales d'Athènes.

Burton, M. and D. R. White. 1987. “Cross-cultural surveys today.” *Annual Review of Anthropology* 16: 143-60.

Cadogan, G. 1983. “Maroni I.” *Report of the Department of Antiquities*, Cyprus: 153-62.

Cadogan, G. 1984. “Maroni and the Late Bronze Age of Cyprus.” In *Cyprus at the Close of the Bronze Age*, edited by V. Karageorghis and J. D. Muhly, pp. 1-10. Nicosia: A.G. Leventis Foundation.

Cadogan, G. 1985. “Maroni.” In *Archaeology in Cyprus 1960-1985*, edited by V. Karageorghis, pp. 195-97. Nicosia: A.G. Leventis Foundation.

Cadogan, G. 1986. “Maroni II.” *Report of the Department of Antiquities*, Cyprus: 40-44.

Cadogan, G. 1987. “Maroni III.” *Report of the Department of Antiquities*, Cyprus: 81-84.

Cadogan, G. 1988. “Maroni IV.” *Report of the Department of Antiquities*, Cyprus: 229-32.

Cadogan, G. 1989. “Maroni and the monuments.” In *Early Society in Cyprus*, edited by E. Peltenburg, pp. 43-51. Edinburgh: Edinburgh University Press.

Cadogan, G. 1992. “Maroni VI.” *Report of the Department of Antiquities*, Cyprus: 51-58.

Cadogan, G. and M. Domurad. 1989. “Maroni V.” *Report of the Department of Antiquities*, Cyprus: 77-81.

Cahill, N. 2002. *Household and City Organization at Olynthus*. New Haven and London: Yale University Press.

Cameron, C. M. 1996. "Observations on the Pueblo house and household." In *People Who Lived in Big Houses: Archaeological Perspectives on Large Domestic Structures*, edited by G. Coupland and E. B. Banning, pp. 71-88. Madison, Wisconsin: Prehistory Press.

Carpenter, J. R. 1981. "Excavations at Phaneromeni1975-1978." In *Studies in Cypriot Archaeology*, edited by J. C. Biers and D. Soren. Los Angeles: Institute of Archaeology, University of California.

Carpenter, J. R. 1982. "Episkopi-Phaneromeni: Bronze Age settlement and cemetery." In *An Archaeological Guide to the Ancient Kourion Area and the Akrotiri Peninsula*, edited by H. W. Swiny, pp. 29-37. Nicosia: Department of Antiquities.

Carter, A. T. 1984. "Household histories." In *Households. Comparative and Historical Studies of the Domestic Group*, edited by R. Netting, R. Wilk, and E. Arnould, pp. 44-83. London: University of California Press.

Casselberry, S. E. and N. Valavanes. 1976. ""Matrilocal" Greek peasants and a reconsideration of residence terminology." *American Ethnologist* 3: 215-25.

Chambon, A. 1984. *Tel el-Far'ah I: L'Age du Fer*. Paris: Editions Recherche sur les Civilisations.

Cherlin, A. 1983. "Changing family and household: contemporary lessons from historical research." *Annual Review of Sociology* 9: 51-66.

Childe, V. G. 1931. *Skara Brae. A Pictish Village in Orkney*. London: Kegan Paul, Trench, Trubnar & Co. Ltd.

Christou, D. 1992. "Chronique des fouilles et découvertes archéologiques à Chypre en 1991." *Bulletin de Correspondance Hellénique* 116: 793-831.

Christou, D. 1993. "Chronique des fouilles et découvertes archéologiques à Chypre en 1992." *Bulletin de Correspondance Hellénique* 117: 719-55.

Christou, D. 1994. "Chronique des fouilles et découvertes archéologiques à Chypre en 1993." *Bulletin de Correspondance Hellénique* 118: 647-93.

Christou, D. 1995. "Chronique des fouilles et découvertes archéologiques à Chypre en 1994." *Bulletin de Correspondance Hellénique* 119: 799-838.

Christou, D. 1996. "Chronique des fouilles et découvertes archéologiques à Chypre en 1995." *Bulletin de Correspondance Hellénique* 120: 1051-100.

Christou, D. 1997. "Chronique des fouilles et découvertes archéologiques à Chypre en 1996." *Bulletin de Correspondance Hellénique* 121: 891-933.

Chu, H.-J. 1969. "A note of utilizing Murdock's ethnographic survey materials for cross-cultural family research." *Journal of Marriage and Family* 31(2): 311-14.

Clément-Charpentier, S. and P. Clément. 1990. *L'Habitation Lao dans les Régions de Vientiane et de Louang Prabang*. Paris: Peeters.

Coldstream, J. N. 1994. “What sort of Aegean Migration?” In *Proceedings of the International Symposium "Cyprus in the 11th Century B.C.*", edited by V. Karageorghis, pp. 143-6. Nicosia: The Archaeological Research Unit of the University of Cyprus and The A.G. Leventis Foundation.

Coleman, J. E. 1985. “Investigations at Alambra 1974-1984.” In *Archaeology in Cyprus 1960-1985*, edited by V. Karageorghis, pp. 125-41. Nicosia: A.G. Leventis Foundation.

Coleman, J. E. and J. A. Barlow. 1979. “Cornell excavations at Alambra, 1978.” *Report of the Department of Antiquities*, Cyprus: 159-67.

Coleman, J. E., J. A. Barlow, M. K. Mogelonsky, and K. W. Schaar. 1996. *Alambra. A Middle Bronze Age Settlement in Cyprus*. Archaeological Investigations by Cornell University 1974-1985. Jonserad: Paul Åströms Förlag.

Connell, J. 1969. *Semnan: Persian City and Region*. University College London Expedition to Iran. London.

Coupland, G. and E. B. Banning. 1996. *People Who Lived in Big Houses:Archaeological Perspectives on Large Domestic Structures*. Monographs in World Archaeology 27. Madison, Wisconsin: Prehistory Press.

Courtois, J.-C., J. Lagarce, and E. Lagarce. 1986. *Enkomi et le Bronze Récent à Chypre*. Nicosia: A.G. Leventis Foundation.

Crewe, L. 2007. *Early Enkomi. Regionalism, Trade and Society at the Beginning of the Late Bronze Age on Cyprus*. BAR International Series 1706. Oxford: Archaeopress.

Crewe, L. 2009. “Western Cyprus in the Bronze Age: Kissonerga-Skalia settlement excavation.” *Bulletin of the Council for British Research in the Levant* 4(1): 61-63.

Crewe, L., P. Croft, L. Graham, and A. McCarthy. 2008. “First preliminary report of excavations at Kissonerga-Skalia, 2007.” *Report of the Department of Antiquities*, Cyprus: 105-19.

Crook, J. A. 1967. “Patria Potestas.” *Classical Quarterly* 17: 113-22.

Czap, P. J. 1983. “"A large family: the peasant's greatest wealth": serf households in Mishino, Russia, 1814-1858.” In *Family Forms in Historic Europe*, edited by R. Wall, J. Robin, and P. Laslett, pp. 105-52. Cambridge: Cambridge University Press.

d'Argemir, D. C. 1988. “Household, family, and social stratification: inheritance and labor strategies in a Catalan village (nineteenth and twentieth centuries).” *Journal of Family History* 13(1): 143-63.

David, N. 1971. “The Fulani compound and the archaeologist.” *World Archaeology* 3(2): 111-31.

David, N. and C. Kramer. 2001. *Ethnoarchaeology in Action*. Cambridge: Cambridge University Press.

de Kind, R. E. L. B. 1998. *Houses in Herculaneum. A New View on the Town Planning and the Building of Insulae III and IV*. Amsterdam: J. C. Gieben.

de Pierrebourg, F. 1999. *L'Espace Domestique Maya. Une Approche Ethnoarchéologique au Yucatan (Mexique)*. Paris Monographs in American Archaeology 3. BAR International Series 764. Oxford: Archaeopress.

de Roche, C. D. 1983. "Population estimates from settlement area and number of residences." *Journal of Field Archaeology* 10(2): 187-92.

Delaigue, M.-C. 1988. *Capileira, Village Andalous. Un Habitat Montagnard à Toits Plats*. BAR archaeological Series 4 (Maison de L'Orient Méditerranéen). International Series 466. Oxford: BAR.

Department for Communities and Local Government. 2007. *Table 810: Household Characteristics: Mean Household Size by Type of Accommodation and By Number of Bedrooms, 2004-2007*. http://www.communities.gov.uk/documents/housing/xls/141518.xls.

Department for Communities and Local Government. 2010. *Housing and Planning Key Facts, England*. http://www.communities.gov.uk/documents/statistics/doc/1553721.doc

Dikaios, P. 1946. "Early Copper Age discoveries in Cyprus, 3rd millennium BC copper mining." *Illustrated London News* (2 March 1946): 244-45.

Dikaios, P. 1969-71. *Enkomi. Excavations 1948-1958*. Mainz am Rhein: Verlag Philipp von Zabern.

Divale, W. T. 1977. "Living floor area and marital residence: a replication." *Behavior Science Research* 12: 109-15.

Dixon, S. 1992. *The Roman Family*. Baltimore, London: The John Hopkins University Press.

Dothan, T. and A. Ben-Tor. 1983. *Excavations at Athienou, Cyprus*. Jerusalem: Institute of Archaeology, Hebrew University.

du Plat Taylor, J. 1952. "A Late Bronze Age settlement at Apliki, Cyprus." *Antiquaries Journal* 32: 133-67.

du Plat Taylor, J. 1957. *Myrtou-Pighades: a late Bronze Age Sanctuary in Cyprus*. Oxford: Ashmolean Museum.

Düring, B. S. 2001. "Social dimensions in the architecture of Neolithic Çatalhöyük." *Anatolian Studies* 51: 1-18.

Elgohary, A. F. and J. Hanson. 1997. "In search of a spatial culture: a study of traditional houses from the informal settlement of el-Hekr, Egypt." In *Tradition, Location and Community: Place Making and Development*, edited by A. Awotona and N. Teymur, pp. 81-120. Aldershot: Avebury.

Ember, M. 1973. "An archaeological indicator of matrilocal versus patrilocal residence." *American Antiquity* 38(2): 177-82.

Evans, R. 1997. "Figures, doors and passages." In *Translations from Drawing to Building and Other Essays*, pp. 55-91. London: Architectural Association Publications.

Evans, S. T. 1993. "Aztec household organization and village administration." In *Prehispanic Domestic Units in Western Mesoamerica. Studies of the Household, Compound, and Residence*, edited by R. S. Santley and K. G. Hirth, pp. 173-89. London: CRC Press.

Falconer, S. E., P. L. Fall, T. W. Davis, M. T. Horowitz, and J. Hunt. 2005. "Initial archaeological investigations at Politiko-Troulia." *Report of the Department of Antiquities*, Cyprus: 69-85.

Fall, P. L., S. E. Falconer, M. Horowitz, J. Hunt, M. C. Metzger, and D. Ryter. 2008. "Bronze Age settlemt and ladscape of Politiko-Troullia, 2005-2007." *Report of the Department of Antiquities*, Cyprus: 183-208.

Fisher, K. D. 2009. "Elite place-making and social interaction in the Late Cypriot Bronze Age." *Journal of Mediterranean Archaeology* 22(2): 183-209.

Flannery, K. V. 2002. "The origins of the village revisited: from nuclear to extended households." *American Antiquity* 67(3): 417-33.

Flaquer, L. 1986. "Family, residence and industrialisation in Northern Catalonia: legal and social aspects." *Sociologia Ruralis* XVI (3/4): 268-84.

Fortes, M. 1949. "Time and social structure: an Ashanti case study." In *Time and Social Structure and Other Essays*, edited by M. Fortes. London: The Athlone Press.

Fortes, M. 1971 (originally 1958). "Introduction." In *The Developmental Cycle in Domestic Groups*, edited by J. R. Goody, pp. 1-14. Cambridge: Cambridge University Press.

Foster, M. S., D. Mitchell, R., C. D. Breternitz, and C. K. Robinson. 1996. "Late Classic Period Hohokam households: a preliminary view from Pueblo Grande." In *People Who Lived in Big Houses: Archaeological Perspectives on Large Domestic Structures*, edited by G. Coupland and E. B. Banning, pp. 27-45. Madison, Wisconsin: Prehistory Press.

Frankel, D. 1993. "Inter- and intrasite variability and social interaction in prehistoric Bronze Age Cyprus: types, ranges, and trends." *Bulletin of the American Schools of Oriental Research* 292: 59-71.

Frankel, D. 1997. "On Cypriot figurines and the origins of patriarchy." *Current Anthropology* 38.1: 84-86.

Frankel, D. 2002. "Social stratification, gender and ethnicity in third millennium Cyprus." In *Engendering Aphrodite. Women and Society in Ancient Cyprus*, edited by D. L. Bolger and N. Serwint, pp. 171-9. Boston, MA: American Schools of Oriental Research.

Frankel, D. 2005. "Becoming Bronze Age: acculturation and enculturation in third millennium BC Cyprus." In *Archaeological Perspectives on the Transmission and Transformation of Culture in the Eastern Mediterranean*, edited by J. Clark, pp. 18-24. Oxford: Council for British Research in the Levant and Oxbow Books.

Frankel, D. and J. M. Webb. 1994. "Hobs and hearths in Bronze Age Cyprus." *Opuscula Atheniensia* XX(4): 51-56.

Frankel, D. and J. M. Webb. 1996a. "Excavations at Marki-Alonia, 1995-6." *Report of the Department of Antiquities*, Cyprus: 51-68.

Frankel, D. and J. M. Webb. 1996b. *Marki Alonia. An Early and Middle Bronze Age Town in Cyprus. Excavations 1990-1994*. Studies in Mediterranean Archaelogy 123 (1). Jonsered: Paul Åströms Förlag.

Frankel, D. and J. M. Webb. 1997. "Excavations at Marki-Alonia, 1996-7." *Report of the Department of Antiquities*, Cyprus 1997: 85-109.

Frankel, D. and J. M. Webb. 1998. “Three faces of identity: ethnicity, community, and status in the Cypriot Bronze Age.” *Journal of Mediterranean Archaeology* 11: 1-12.

Frankel, D. and J. M. Webb. 1999. “Excavations at Marki-Alonia, 1998-9.” *Report of the Department of Antiquities*, Cyprus: 87-110.

Frankel, D. and J. M. Webb. 2000. “Excavations at Marki-Alonia, 1999-2000.” *Report of the Department of Antiquities*, Cyprus: 65-94.

Frankel, D. and J. M. Webb. 2001. “Population, households, and ceramic consumption in a prehistoric Cypriot village.” *Journal of Field Archaeology* 28(1): 115-29.

Frankel, D. and J. M. Webb. 2006a. “Neighbours: negotiating space in a prehistoric village.” *Antiquity* 80: 287-302.

Frankel, D. and J. M. Webb. 2006b. *Marki Alonia. An Early and Middle Bronze Age Settlement in Cyprus. Excavations 1995-2000*. Studies in Mediterranean Archaelogy 123 (2). Jonsered: Paul Åströms Förlag.

Frankel, D., J. M. Webb, and C. Eslick. 1996. “Anatolia and Cyprus in the third millennium BCE. A speculative model of interaction.” In *Cultural Interactions in the Ancient Near East*, edited by G. Bunnens, pp. 37-50. Lueven: Peeters.

Frankel, R. 1999. *Wine and Oil Production in Antiquity in Israel and Other Mediterranean Countries*. Sheffield: Sheffield Academic Press.

Freed, S. A. and R. S. Freed. 1983. “The domestic cycle in India: natural history of a will-o'-the-wisp.” *American Ethnologist* 10(2): 312-27.

Furumark, A. and C. Adelman. 2003. *Swedish Excavations at Sinda, Cyprus. Excavations Conducted by Arne Furumark 1947-1948*. Stockholm: Svenska Institutet i Athen.

Gabrilopoulos, N., C. Mather, and C. R. Apentiik. 2002. “Lineage organisation of the Tallensi compound: the social logic of domestic space in Northern Ghana.” *Africa* 72(2): 221-44.

Gale, N. H. 1991. *Bronze Age Trade in the Mediterranean*. Jonsered: Paul Åströms Förlag.

George, M. 1997. “Repopulating the Roman house.” In *The Roman Family in Italy. Status, Sentiment, Space*, edited by B. Rawson and P. Weaver, pp. 299-319. Oxford: Clarendon Press.

Giddens, A. 1984. *The Constitution of Society. Outline of the Theory of Structuration*. Berkeley and Los Angeles: University of California Press.

Gjerstad, E. 1926. *Studies on Prehistoric Cyprus*. Uppsala: Uppsala Universitets Årsskrift.

Gjerstad, E., J. Lindros, E. Sjöqvist, and A. Westholm. 1934. *The Swedish Cyprus Expedition: Finds and Results of the Excavations in Cyprus, 1927-1931*. Stockholm: The Swedish Cyprus Expedition.

Gjerstad, E., J. Lindros, E. Sjöqvist, and A. Westholm. 1935. *The Swedish Cyprus Expedition: Finds and Results of the Excavations in Cyprus, 1927-1931*. Stockholm: The Swedish Cyprus Expedition.

Goldschmidt, W. and E. J. Kunkel. 1971. "The structure of the peasant family." *American Anthropologist* 73(5): 1058-76.

Goodenough, W. H. 1956. "Residence rules." *Southwestern Journal of Anthropology* 12: 22-37.

Goody, J. R. 1958. *The Developmental Cycle in Domestic Groups*. Cambridge: Cambridge University Press.

Goody, J. R. 1971 (originally 1958). "The fission of domestic groups among the LoDagaba." In *The Developmental Cycle in Domestic Groups*, edited by J. R. Goody, pp. 53-91. Cambridge: Cambridge University Press.

Goren, Y., S. Bunimovitz, I. Finkelstein, and N. Na'aman. 2003. "The location of Alashiya: new evidence from petrographic investigation of Alashiyan tablets from El-Amarna and Ugarit." *American Journal of Archaeology* 107: 233-55.

Graham, M. 1994. *Mobile Farmers: an Ethnoarchaeological Approach to Settlement Organization Among the Rarámuri of Northwestern Mexico*. Ann Arbor, Michigan: International Monographs in Prehistory.

Gulick, J. 1955. *Social Structure and Cultural Change in a Lebanese Village*. New York: Wenner Gren Foundation for Anthropological Research.

Hadjisavvas, S. 1986. "Alassa. A new Late Cypriot site." *Report of the Department of Antiquities*, Cyprus: 62-67.

Hadjisavvas, S. 1989. "A Late Cypriot community at Alassa." In *Early Society in Cyprus*, edited by E. Peltenburg, pp. 32-42. Edinburgh: Edinburgh University Press.

Hadjisavvas, S. 1991. "LCIIC to LCIIIA without intruders. The case of Alassa-Pano Mandilares." In *Cypriot Ceramics. Reading the Prehistoric Record*, edited by J. A. Barlow, D. L. Bolger, and B. Kling, pp. 173-80. Philadelphia: The A.G. Leventis Foundation and The University Museum, Pennsylvania.

Hadjisavvas, S. 1994. "Alassa archaeological project 1991-1993." *Report of the Department of Antiquities*, Cyprus: 107-14.

Hajnal, J. 1982. "Two kinds of preindustrial household formation system." *Population and Development Review* 8(3): 449-94.

Hammel, E. 1984. "On the *** of studying household form and function." In *Households. Comparative and Historical Studies of the Domestic Group*, edited by R. Netting, R. R. Wilk, and E. J. Arnould, pp. 29-43. London: University of California Press.

Hammel, E. and P. Laslett. 1974. "Comparing household structure over time and between cultures." *Comparative Studies in Society and History* 16: 73-111.

Hanson, J. 1998. *Decoding Homes and Houses*. Cambridge: Cambridge University Press.

Hareven, T. K. 1971. "The history of the family as an interdisciplinary field." *Journal of Interdisciplinary History* 2(2): 399-414.

Hareven, T. K. 1991. "The history of the family and the complexity of social change." *The American Historical Review* 96(1): 95-124.

Hayden, B., G. A. Reinhardt, R. MacDonald, D. Holmberg, and D. Crellin. 1996. "Space per capita and the optimal size of housepits." In *People Who Lived in Big Houses: Archaeological Perspectives on Large Domestic Structures*, edited by G. Coupland and E. B. Banning, pp. 151-64. Madison, Wisconsin: Prehistory Press.

Heaton, T. B. and C. Hoppe. 1987. "Widowed and married: comparative change in living arrangements, 1900 and 1980." *Social Science History* 11(3): 261-80.

Hendon, J. A. 1996. "Archaeological approaches to the organization of domestic labor: household practice and domestic relations." *Annual Review of Anthropology* 25: 45-61.

Hillier, B. and J. Hanson. 1984. *The Social Logic of Space*. Cambridge: Cambridge University Press.

Hillier, B., J. Hanson, and H. Grahame. 1987. "Ideas are in things: an application of the space syntax method to discovering housing genotypes." *Environment and Planning B* 14: 363-85.

Hirth, K. G. 1993. "Identifying rank and socioeconomic status in domestic contexts: an example from Central Mexico." In *Prehispanic Domestic Units in Western Mesoamerica. Studies of the Household, Compound, and Residence*, edited by R. S. Santley and K. G. Hirth, pp. 121-46. London: CRC Press.

Hockings, P. 1994. *Encyclopaedia of World Cultures Volume V. East and Southeast Asia*. London: Prentice Hall Int.

Horne, L. 1994. *Village Spaces. Settlement and Society in Northeastern Iran*. London: Smithsonian Institution Press.

Housing Data and Statistics. 2004. *Overcrowding in England: the National and Regional Picture - Statistics*. www.communities.gov.uk/index.asp?id=1152908

Hult, G. 1978. *Hala Sultan Tekke 4 (Excavations in Area 8 in 1974 and 1975)*. Göteborg: Paul Åströms Förlag.

Hult, G. 1981. *Hala Sultan Tekke 7 (Excavations in Area 8 in 1977)*. Göteborg: Paul Åströms Förlag.

Hult, G. 1992. *Nitovikla Reconsidered*. Stockholm: Medelhavsmuseet.

Humphrey, C. 1988. "No place like home in anthropology: the neglect of architecture." *Anthropology Today* 4(1): 16-18.

Iacovou, M. 1994. "The topography of eleventh century B.C. Cyprus." In *Proceedings of the International Symposium "Cyprus in the 11th Century B.C*", edited by V. Karageorghis, pp. 149-64. Nicosia: The Archaeological Research Unit of the University of Cyprus and The A.G. Leventis Foundation.

Iacovou, M. 2005. "Cyprus at the dawn of the first millenium BC: cultural homogenisation versus the tyranny of ethnic identifications." In *Archaeological Perspectives on the Transmission and Transformation of Culture in the Eastern Mediterranean*, edited by J. Clark, pp. 125-34. Oxford: Council for British Research in the Levant and Oxbow Books.

Imhoff, E. v., A. Kuijsten, P. Hooimeijer, and L. J. G. v. Wissen. 1995. *Household Demography and Household Modelling.* New York: Plenum Press.

Jacobs, L. 1979. “Tell-i Nun: archaeological implications of a village in transition.” In *Ethnoarchaeology. Implications of Ethnography for Archaeology*, edited by C. Kramer, pp. 175-91. New York: Columbia University Press.

Janes, R. R. 1983. *Archaeological Ethnography Among Mackenzie Basin Dene, Canada*. Calgary: Arctic Institute of North America.

Janssens, A. 1986. “Industrialization without family change? The extended family and the life cycle in a Dutch industrial town, 1880-1920.” *Journal of Family History* 11: 25-42.

Janssens, A. 1993. *Family and Social Change. The Household as a Process in an Industrializing Community*. Cambridge: Cambridge University Press.

Kamp, K. A. 1982. *Architectural Indices of Socio-economic Variability: an Ethnoarchaeological Case Study from Syria*. Tucson: University of Arizona.

Kamp, K. A. 1987. “Affluence and image: ethnoarchaeology in a Syrian village.” *Journal of Field Archaeology* 14: 283-96.

Karageorghis, V. 1971. “Chronique des fouilles et découvertes archéologiques à Chypre en 1970.” *Bulletin de Correspondance Hellénique* 95: 335-432.

Karageorghis, V. 1972. “Chronique des fouilles et découvertes archéologiques à Chypre en 1971.” *Bulletin de Correspondance Hellénique* 96: 1005-88.

Karageorghis, V. 1973. “Chronique des fouilles et découvertes archéologiques à Chypre en 1972.” *Bulletin de Correspondance Hellénique* 97: 601-89.

Karageorghis, V. 1974. “Chronique des fouilles et découvertes archéologiques à Chypre en 1973.” *Bulletin de Correspondance Hellénique* 98: 821-96.

Karageorghis, V. 1980. “Chronique des fouilles et découvertes archéologiques à Chypre en 1979.” *Bulletin de Correspondance Hellénique* 104: 761-803.

Karageorghis, V. 1981. “Chronique des fouilles et découvertes archéologiques à Chypre en 1980.” *Bulletin de Correspondance Hellénique* 105: 967-1024.

Karageorghis, V. 1982. “Chronique des fouilles et découvertes archéologiques à Chypre en 1981.” *Bulletin de Correspondance Hellénique* 106: 685-744.

Karageorghis, V. 1983. “Chronique des fouilles et découvertes archéologiques à Chypre en 1982.” *Bulletin de Correspondance Hellénique* 107: 905-53.

Karageorghis, V. 1984. “Chronique des fouilles et découvertes archéologiques à Chypre en 1983.” *Bulletin de Correspondance Hellénique* 108: 893-966.

Karageorghis, V. 1988. “Chronique des fouilles et découvertes archéologiques à Chypre en 1987.” *Bulletin de Correspondance Hellénique* 112: 793-855.

Karageorghis, V. 1989. “Chronique des fouilles et découvertes archéologiques à Chypre en 1988.” *Bulletin de Correspondance Hellénique* 113: 789-853.

Karageorghis, V. 1994. “The prehistory of an ethnogenesis.” In *Proceedings of the International Symposium "Cyprus in the 11th Century B.C."*, edited by V. Karageorghis, pp. 1-9. Nicosia: The Archaeological Research Unit of the University of Cyprus and The A.G. Leventis Foundation.

Karageorghis, V. and M. Demas. 1981. "Excavations at Pyla-Kokkinokremos (first preliminary report)." *Report of the Department of Antiquities*, Cyprus: 135-41.

Karageorghis, V. and M. Demas. 1984. *Pyla-Kokkinokremos. A Late 13th Century BC Fortified Settlement in Cyprus*. Nicosia: Department of Antiquities.

Karageorghis, V. and M. Demas. 1985. *Excavations at Kition V. The Pre-Phoenician Levels*. Nicosia: Department of Antiquities.

Karageorghis, V. and M. Demas. 1988. *Excavations at Maa-Palaeokastro 1979-1986*. Nicosia: Department of Antiquities.

Karageorghis, V., M. Demas, and B. Kling. 1982. "Excavations at Maa-Palaeokastro, 1979-1982. A preliminary report." *Report of the Department of Antiquities*, Cyprus: 86-108.

Kempson, E. 1999. *Overcrowding in Bangladeshi households. A case study of Tower Hamlets*. London: Policy Studies Institute. Report No. 863.

Kent, S. 1990. "A cross-cultural study of segmentation, architecture, and the use of space." In *Domestic Architecture and the Use of Space. An Interdisciplinary Cross-Cultural Study*, edited by S. Kent, pp. 127-52. Cambridge: Cambridge University Press.

Kertzer, D. I. 1984. "Anthropology and family history." *Journal of Family History* 9(3): 201-06.

Kertzer, D. I. 1985. "Future directions in historical household studies." *Journal of Family History* 10: 98-107.

Kertzer, D. I. 1989. "The joint family household revisited: demographic constraints and household complexity in the European past." *Journal of Family History* 14(1): 1-15.

Kertzer, D. I. 1991. "Household history and sociological theory." *Annual Review of Sociology* 17: 155-79.

Keswani, P. S. 1993. "Models of local exchange in Late Bronze Age Cyprus." *Bulletin of the American Schools of Oriental Research* 292: 73-84.

Keswani, P. S. 1996. "Hierarchies, heterarchies, and urbanization processes: the view from Bronze Age Cyprus." *Journal of Mediterranean Archaeology* 9.2: 211-50.

Kintz, E. R. 1983. "Household composition: an analysis of the composition of residential compounds in Coba." In *Coba, a Classic Maya Metropolis*, edited by W. J. Folan, E. R. Kintz, and L. A. Fletcher, pp. 133-47. London: Academic Press.

Kling, B. and J. D. Muhly. 2007. *Joan du Plat Taylor's Excavations at the Late Bronze Age Mining Settlement at Apliki Karamallos, Cyprus.* Sävedalen: Paul Aaströms Förlag.

Knapp, A. B. 1993. "Social complexity: incipience, emergence, and the development of prehistoric Cyprus." *Bulletin of the American Schools of Oriental Research* 292: 85-106.

Knapp, A. B. 1996a. *Near Eastern and Aegean Texts from the Third to the First Millennium BC.* Sources for the History of Cyprus II. New York: Greece and Cyprus Research Centre.

Knapp, A. B. 1996b. “Settlement and society on Late Bronze Age Cyprus: dynamics and development.” In *Late Bronze Age Settlement in Cyprus: Function and Relationship*, edited by P. Åström and E. Herscher, pp. 54-80. Jonsered: Paul Åströms Förlag.

Knapp, A. B. 1999. “Reading the sites: prehistoric Bronze Age settlements on Cyprus.” *Bulletin of the American Schools of Oriental Research* 313: 75-86.

Knapp, A. B. 2008 *Prehistoric and Protohistoric Cyprus. Identity, Insularity and Connectivity*. Oxford: Oxford Univeristy Press.

Knapp, A. B. and S. O. Held. 1994. “The prehistory of Cyprus: problems and prospects.” *Journal of World Prehistory* 8(4): 377-453.

Kolb, C. C. 1985. “Demographic estimates in archaeology: contributions from ethnoarchaeology on Mesoamerican peasants.” *Current Anthropology* 26(5): 581-99.

Kramer, C. 1982. *Village Ethnoarchaeology. Rural Iran in Archaeological Perspective*. New York, London: Academic Press.

Krech III, S. 1980. “Northern Athapaskan Ethnology in the 1970s.” *Annual Review of Anthropology* 9: 83-100.

Kunstadter, P. 1984. “Cultural ideals, socioeconomic change, and household composition: Karen, Lua', Hmong, and Thai in Northwestern Thailand.” In *Households. Comparative and Historical Studies of the Domestic Group*, edited by R. Netting, R. Wilk, and E. Arnould, pp. 299-329. London: University of California Press.

Lancret, N. 1997. *La Maison Balinaise en Secteur Urbain. Étude ethno-architecturale*. Paris: EHESS.

Larsson, A. and V. Larsson. 1984a. *A Documentation of Twelve Tswana Dwellings. Supplement to "Traditional Tswana Housing: a Study in Four Villages in Eastern Botswana*". Lund: University of Lund, School of Architecture, Department of Building Function Analysis. Report R1.

Larsson, A. and V. Larsson. 1984b. *Traditional Tsawna Housing. A Study in Four Villages in Eastern Botswana*. Stockholm: Swedish Council for Building Research. Report D7.

Laslett, P. 1972. “Introduction: the history of the family.” In *Household and Family in Past Time. Comparative Studies in the Size and Structure of the Domestic Group Over the Last Three Centuries in England, France, Serbia, Japan and Colonial North America, with Further Materials from Western Europe*, edited by P. Laslett and R. Wall, pp. 1-89. Cambridge: Cambridge University Press.

Laslett, P. 1984. “The family as a knot of individual interests.” In *Households. Comparative and Historical Studies of the Domestic Group*, edited by R. Netting, R. Wilk, and E. Arnould, pp. 353-79. London: University of California Press.

Laslett, P. 1988. “Family, kinship and collectivity as systems of support in pre-industrial Europe: a consideration of the 'nuclear-hardship' hypothesis.” *Continuity and Change* 3(2): 153-75.

Laslett, P. and R. Wall. 1972. *Household and Family in Past Time. Comparative Studies in the Size and Structure of the Domestic Group Over the Last Three Centuries in England, France, Serbia, Japan and Colonial North America, with Further Materials from Western Europe.* Cambridge: Cambridge University Press.

Lawrence, D. L. and S. M. Low. 1990. “The built environment and spatial form.” *Annual Review of Anthropology* 19: 453-505.

Lebeuf, J. P. 1961. *L'Habitation des Fali, Montagnards du Cemeroun Septentrional: Technologie, Sociologie, Mythologie, Symbolisme*. Paris: Hachette.

LeBlanc, S. 1971. “An addition to Naroll's suggested floor area and settlement population relationship.” *American Antiquity* 36(2): 210-11.

Lee, J. and J. Gjerde. 1986. “Comparative household morphology of stem, joint and nuclear household systems: Norway, China, and the United States.” *Continuity and Change* 1(1): 89-111.

Ling, R. 1997. *The Insula of the Menander at Pompeii. Volume I: the Structures*. Oxford: Clarendon Press.

Litwak, E. 1960. “Geographic mobility and extended family cohesion.” *American Sociological Review* 25(3): 385-94.

Logan, J. R. and F. Bian. 1999. “Family values and coresidence with married children in urban China.” *Social Forces* 77(4): 1253-82.

Logan, J. R., F. Bian, and Y. Bian. 1998. “Tradition and change in the urban Chinese family: the case of living arrangements.” *Social Forces* 76(3): 851-82.

London Housing Briefing 2004. *Overcrowding in London*. The Association of London Government.

Lowell, J. C. 1991. *Prehistoric Households at Turkey Creek Pueblo, Arizona*. Tucson: The University of Arizona Press.

MacDougall, R. D. 1971. *Domestic Architecture Among the Kandyan Sinhalese*. University Microfilms. Ann Arbor.

Maiuri, A. 1958. *Ercolano. I Nuovi Scavi, 1927-1958*. Roma: Instituto poligrafico dello Stato, Libreria della Stato.

Manning, S. W. 1998. "Changing pasts and socio-politico cognition in Late Bronze Age Cyprus." *World Archaeology* 30: 39-58.

Manning, S. W., D. L. Bolger, A. Swinton, and M. J. Ponting. 1994a. “Maroni Valley Archaeological Survey Project: preliminary report on the 1992-1993 seasons.” *Report of the Department of Antiquities*, Cyprus: 345-67.

Manning, S. W. and D. H. Conwell. 1992. “Maroni Valley Archaeological Survey Project: preliminary report on the 1990-1991 field seasons.” *Report of the Department of Antiquities*, Cyprus: 271-83.

Manning, S. W., L. Steel, H. G. Jansen, D. H. Conwell, D. Sewell, A. Swinton, and D. Collon. 1994b. “Tsaroukkas, Mycenaeans and Trade Project: preliminary report on the 1993 season.” *Report of the Department of Antiquities*, Cyprus: 83-106.

Marchand, T. H. J. 1993. “Giddan Hausa.” Unpublished BA dissertation. Montreal: Mc Gill University.

Martin, D. B. 1996. “The construction of the ancient family: methodological considerations.” *The Journal of Roman Studies* 86: 40-60.

McEnroe, J. 1982. “A typology of Minoan Neopalatial houses.” *American Journal of Archaeology* 86: 3-19.

McNett, C. W. and R. E. Kirk. 1968. “Drawing random samples in cross-cultural studies: a suggested method.” *American Anthropologist* 70(1): 50-55.

Merillees, R. S. 1992. “The government of Cyprus in the Late Bronze Age.” In *Acta Cypria 3: Acts of an International Congress on Cypriot Archaeology* (Götebor, 22-24 August 1991), edited by P. Åström, pp. 310-29. Jonsered: Paul Åström's Förlag.

Metaxa Muhly, P. 1984. “Minoan hearths.” *American Journal of Archaeology* 88: 107-22.

Milisauskas, S. 1972. “An analysis of Linear culture longhouses at Olszanica BI, Poland.” *World Archaeology* 4: 57-74.

Morelli, G. A., B. Rogoff, D. Oppenheim, and D. Goldsmith. 1992. “Cultural variation in infants' sleeping arrangements: questions of independence.” *Developmental Psychology* 28(4): 604-13.

Morley, N. 1999. “Review: Roman villas and society.” *The Classical Review* 49(1): 199-201.

Muhly, J. D. 1984. “The role of the Sea Peoples in Cyprus during the LCIII period.” In *Cyprus at the Close of the Late Bronze Age*, edited by V. Karageorghis and J. D. Muhly, pp. 39-55. Nicosia: A.G. Leventis Foundation.

Muhly, J. D. 1996. “The significance of metals in the Late Bronze Age economy of Cyprus.” In *The Development of the Cypriot Economy from the Prehistoric Period to the Present Day*, edited by V. Karageorghis and D. Michaelides, pp. 45-60. Nicosia: University of Cyprus and The Bank of Cyprus.

Muhly, J. D., R. Maddin, and V. Karageorghis. 1982. “*Early Metallurgy in Cyprus 4000-500 BC.”* ACTA of the International Archaeological Symposium 1-6 June 1981. Nicosia: Pierides Foundation.

Murdock, G. P. 1957. “World Ethnographic Sample.” *American Anthropologist* 59(4): 664-87.

Murdock, G. P. and D. R. White. 1969. “Standard cross-cultural sample.” *Ethnology* 8: 329-69.

Murphy, M. 1991. “Modelling households: a synthesis.” *Population Studies* 45 (Population Research in Britain Supplement): 157-76.

Mutchler, J. E. and L. J. Krivo. 1989. “Availability and affordability: household adaptation to a housing squeeze.” *Social Forces* 68(1): 241-61.

Nappo, S. C. 1997. “Urban transformation at Pompeii in the later 3rd and early 2nd c. B.C.” In *Domestic Space in the Roman World: Pompeii and Beyond*, edited by R. Laurence and A. Wallace-Hadrill, pp. 91-120. Portsmouth, RI: Journal of Roman Archaeology.

Naroll, R. 1962. “Floor area and settlement population.” *American Antiquity* 27: 587-88.

Naroll, R. 1967. “The proposed HRAF probability sample.” *Behavioral Science Notes* 2: 70-80.

Negbi, O. 2005. “Urbanism on Late Bronze Age Cyprus: LCII in retrospect.” *Bulletin of the American Schools of Oriental Research* 337: 1-40.

Netting, R. 1982. “Some home truths on household size and wealth.” *American Behavioral Scientist* 25: 641-62.

Netting, R. 1993. “Smallholders, householders, freeholders: why the family farm works well worldwide.” In *The Household Economy: Reconsidering the Domestic Mode of Production*, edited by R. Wilk, pp. 221-44. London: Westview Press.

Netting, R., R. Wilk, and E. Arnould. 1984a. *Households. Comparative and Historical Studies of the Domestic Group*. London: University of California Press.

Netting, R., R. Wilk, and E. Arnould. 1984b. “Introduction.” In *Households. Comparative and Historical Studies of the Domestic Group*, edited by R. Netting, R. Wilk, and E. Arnould, pp. xiii-xxxviii. London: University of California Press.

Netting, R. M. 1965. “Household organisation and intensive agriculture: the Kofyar case.” *Africa: Journal of the International African Institute* 35(4): 422-29.

Nevett, L. C. 1997. “Perceptions of domestic space in Roman Italy.” In *The Roman Family in Italy. Status, Sentiment, Space*, edited by B. Rawson and P. Weaver, pp. 281-98. Oxford: Clarendon Press.

Nimkoff, M. F. and R. Middletone. 1960. “Types of family and types of economy.” *American Journal of Sociology* 68: 215-25.

O'Neill, B. J. 1987. *Social Inequality in a Portuguese Hamlet. Land, Late Marriage, and Bastardy, 1870-1978*. Cambridge: Cambridge University Press.

Öbrink, U. 1979. *Hala Sultan Tekke 5 (Excavations in Area 22 1971-1973 and 1975-1978)*. Göteborg: Paul Åströms Förlag.

Office for National Statistics. 2004. *Census 2001. Definitions*. www.statistics.gov.uk/dowloads/census2001/definitions_chapters_1_5.pdf

Orhun, D., B. Hillier, and J. Hanson. 1995. “Spatial types in traditional Turkish houses.” *Environment and Planning B: Planning and Design* 22: 475-98.

Orhun, D., B. Hillier, and J. Hanson. 1996. “Socialising spatial types in traditional Turkish houses.” *Environment and Planning B: Planning and Design* 23: 329-51.

Oswald, D. B. 1987. “The organization of space in residential buildings: a cross-cultural perspective.” In *Method and Theory for Activity Area Research*. An Ethnoarchaeological Approach, edited by S. Kent, pp. 295-344. New York: Columbia University Press.

Otterbein, K. F. 1970. “The developmental cycle of the Andros household: a diachronic analysis.” *American Anthropologist* 72(6): 1412-19.

Overbeck, J. C. and S. Swiny. 1972. *Two Cypriot Bronze Age Sites at Kafkallia (Dhali).* Göteborg: Paul Åströms Förlag.

Parkin, T. G. 1994. “Review: Marriage, Divorce and Children in Ancient Rome; The Roman Family; The Roman Household: a Sourcebook; Roman Marriage: Iusti Coniuges from the Time of Cicero to the Time of Ulpian; Die Ehegesetze des Augustus: Eine Untersuchung im Rahmen der Gesellschaftspolitik des Princeps; Discovering the Roman Family: Studies in Roman Social History; The Family in Italy from Antiquity to the Present; Parenté et Stratégies Familiales dans l'Antiquité Romaine; War, Women and Children in Ancient Rome.” *The Journal of Roman Studies* 84: 178-85.

Pasternak, B., C. R. Ember, and M. Ember. 1976. “On the conditions favouring extended family households.” *Journal of Anthropological Research* 32(2): 109-23.

Pasternak, B., C. R. Ember, and M. Ember. 1997. *Sex, Gender and Kinship. A Cross-cultural Perspective.* New Jersey: Prentice Hall.

Peacock, J. L. 1973. *Indonesia: an Anthropological Perspective*. Pacific Palisades, California: Goodyear Publishing Company, Inc.

Peltenburg, E. 1991. “Kissonerga-Mosphilia: a major Chalcolithic site in Cyprus.” *Bulletin of the American Schools of Oriental Research* 282/283: 17-35.

Peltenburg, E. 1994. “Constructing authority: the Vounous enclosure model.” *Opuscula Atheniensia* 20: 157-62.

Peltenburg, E. 1996. “From isolation to state formation in Cyprus, c.3500 - 1500 B.C.” In *The Development of the Cypriot Economy from the Prehistoric to the Present Day*, edited by V. Karageorghis and D. Michaelides, pp. 17-44. Nicosia: University of Cyprus and the Bank of Cyprus.

Peltenburg, E. 1998. *Lemba Archaeological Project. Volume II.1A. Excavations at Kissonerga-Mosphilia 1979-1992*. Jonsered: Paul Åströms Förlag.

Peregrine. P. N. 1996. "Ethnology versus ethnographic analogy: a common confusion in archaeological interpretation." *Cross-Cultural Research* 30(4): 316-329.

Pickles, S. and E. Peltenburg. 1998. “Metallurgy, society and the Bronze/Iron transition in the East Mediterranean and the Near East.” *Report of the Department of Antiquities*, Cyprus: 67-100.

Pirson, F. 1997. “Rented accommodation at Pompeii: the evidence of the Insula Arriana Polliana VI.6.” In *Domestic Space in the Roman World: Pompeii and Beyond*, edited by R. Laurence and A. Wallace-Hadrill, pp. 165-81. Portsmouth, RI: Journal of Roman Archaeology.

Price, M. F. 1999. “All in the family: the impact of gender and family constructs on the study of prehistoric settlement.” In *Making Places in the Prehistoric World: Themes in Settlement Archaeology*, edited by J. Bruck and M. Goodman, pp. 30-51. London: UCL Press.

Reher, D. S. 1988. “Household and family on the Castilian meseta: the province of Cuenca from 1750 to 1970.” *Journal of Family History* 13(1): 59-74.

Romano, D. G. 2003. “Minoan surveyors and town planning at Gournia.” In *Metron: Measuring the Aegean Bronze Age. Proceedings of the 9th International Aegean Conference, New Haven, Yale University, 18-21 April 2002*, edited by K. P. Foster and R. Laffineur, pp. 247-56. Liège/Austin: Université de Liège, University of Texas at Austin.

Romanou, D. 2007. “Residence design and variation in residential group structure: a case study, Mallia.” In *Building Communities: House, Settlement and Society in the Aegean and Beyond*, edited by R. Westgate, N. Fisher, and J. Whitley, pp. 77-90. Athens: British School at Athens.

Rosenfeld, H. 1958. “Processes of structural change within the Arab village extended family.” *American Anthropologist* 60(6.1): 1127-39.

Saller, R. P. 1987. “Men's age at marriage and its consequences in the Roman family.” *Classical Philology* 82(1): 21-34.

Saller, R. P. and B. D. Shaw. 1984. “Tombstones and Roman family relations in the Principate: civilians, soldiers and slaves.” *The Journal of Roman Studies* 74: 124-56.

Santley, R. S. and K. G. Hirth. 1993. *Prehispanic Domestic Units in Western Mesoamerica: Studies of the Household, Compound and Residence*. London: CRC Press.

Schaeffer, C. F. A. 1971. *Alasia I, Publié à l'Occasion de la XXe Campagne de Fouilles à Enkomi-Alasia (1969)*. Mission Archéologique d'Alasia 4. Paris: Klincksieck.

Schiffer, M. B. 1976. *Behavioral Archeology*. New York, London: Academic Press Inc.

Schloen, J. D. 2001. *The House of the Father as Fact and Symbol. Patrimonialism in Ugarit and the Ancient Near East*. Winona Lake, Indiana: Harvard Semitic Museum Publications, and Eisenbrauns.

Schwerdtfeger, F. W. 1982. *Traditional Housing in African Cities. A Comparative Study of Houses in Zaria, Ibadan and Marrakech*. Chichester: John Wiley & Sons.

Sherratt, S. E. 1991. “Cypriot pottery of Aegean type in LCII-III: problems of classification, chronology and interpretation.” In *Cypriot Ceramics: Reading the Prehistoric Record*, edited by J. A. Barlow, D. L. Bolger, and B. Kling, pp. 185-98. University of Pennsylvania, Philadephia: University of Museum Publications.

Smith, H. 1984. “Family and class: the household economy of Languedoc winegrowers, 1830-1870.” *Journal of Family History* 9(1): 64-87.

Smith, J. S. 2008. “Settlement to sanctuary at Phlamoudhi-Melissa.” In *Views from Phlamoudhi, Cyprus*, edited by J. S. Smith, pp. 45-68. Boston: American Schools of Oriental Research.

Smith, J. T. 1978. “Villas as a key to social structure.” In *Studies in the Romano-British Villa*, edited by M. Todd, pp. 149-56. Leicester: Leicester University Press.

South, A. K. 1980. “Kalavasos-Ayios Dhimitrios 1979: a summary report.” *Report of the Department of Antiquities*, Cyprus: 22-53.

South, A. K. 1982. “Kalavasos-Ayios Dhimitrios 1980-1981.” *Report of the Department of Antiquities*, Cyprus: 60-68.

South, A. K. 1983. “Kalavasos-Ayios Dhimitrios 1982.” *Report of the Department of Antiquities*, Cyprus: 92-116.

South, A. K. 1984a. “Kalavasos-Ayios Dhimitrios 1983.” *Report of the Department of Antiquities*, Cyprus: 14-41.

South, A. K. 1984b. "Kalavasos-Ayios Dhimitrios and the Late Bronze Age of Cyprus." In *Cyprus at the Close of the Late Bronze Age*, edited by V. Karageorghis and J. D. Muhly, pp. 11-18. Nicosia: A.G. Leventis Foundation.

South, A. K. 1988. "Kalavasos-Ayios Dhimitrios 1987: an important ceramic group from Building X." *Report of the Department of Antiquities*, Cyprus: 223-28.

South, A. K. 1991. "Kalavasos-Ayios Dhimitrios 1990." *Report of the Department of Antiquities*, Cyprus: 131-39.

South, A. K. 1992. "Kalavasos-Ayios Dhimitrios 1991." *Report of the Department of Antiquities*, Cyprus: 133-46.

South, A. K. 1996. "Kalavasos-Ayios Dhimitrios and the organisation of Late Bronze Age Cyprus." In *Late Bronze Age Settlement in Cyprus: Function and Relationship*, edited by E. Herscher and P. Åström, pp. 39-49. Jonsered: Paul Åströms Förlag.

South, A. K. 1997. "Kalavasos-Ayios Dhimitrios 1992-1996." *Report of the Department of Antiquities*, Cyprus: 151-75.

South, A. K., P. Russell, and P. S. Keswani. 1989. *Vasilikos Valley Project 3: Kalavasos-Ayios Dhimitrios II. Ceramics, Objects, Tombs, Specialist Studies*. Göteborg: Paul Åströms Förlag.

Steadman, S. R. 1996. "Recent research in the archaeology of architecture: beyond the foundations." *Journal of Archaeological Research* 4(1): 51-92.

Steel, L. and S. Thomas. 2008. "Excavations at Arediou-Vouppes (Lithosouros), Cyprus: an interim report on excavations 2005-2006." *Report of the Department of Antiquities*, Cyprus: 227-49.

Stevenson, M. G. 1982. "Towards an understanding of site abandonment behavior: evidence from historic mining camps in the Southwest Yukon." *Journal of Anthropological Archaeology* 1: 237-65.

Stone, E. C. 1981a. "Texts, architecture and ethnographic analogy: patterns of residence in Old Babylonian Nippur." *Iraq* 43: 19-33.

Stone, L. 1977. *Family, Sex and Marriage in England, 1500-1800*. London: Weidenfeld & Nicolson.

Stone, L. 1981b. "Family history in the 1980s. Past achievements and future trends." *Journal of Interdisciplinary History* XII:I: 51-87.

Sweet, L. E. 1960. *Tell Toqaan:A Syrian Village*. Ann Arbor: University of Michigan.

Swiny, S. 1985. "Sotira-Kaminoudhia and the Chalcolithic-Early Bronze Age transition in Cyprus." In *Archaeology in Cyprus 1960-1985*, edited by V. Karageorghis, pp. 115-24. Nicosia: A. G. Leventis Foundation.

Swiny, S. 1986. *The Kent State University Expedition to Episkopi Phaneromeni. Part 2*. Studies in Mediterranean Archaeology LXXIV:2. Nicosia: Paul Åströms Förlag.

Swiny, S. 1989. "From round house to duplex: a re-assessment of prehistoric Cypriot Bronze Age society." In *Early Society in Cyprus*, edited by E. Peltenburg, pp. 14-31. Edinburgh: Edinburgh University Press.

Swiny, S. 2008. “Of cows, copper, corners, and cult: the emergence of the Cypriot Bronze Age.” *Near Eastern Archaeology* 71(1-2): 41-51.

Swiny, S., G. Rapp, and E. Herscher. 2003. “*Sotira Kaminoudhia. An Early Bronze Age Site in Cyprus.”* American Schools of Oriental Research Archaeological Reports 08; Cyprus American Archaeological Research Institute Monograph Series, Volume 4. Boston, MA: American School of Oriental Research.

Thomas, N. W. 1906. *Kinship Organization and Group Marriage in Australia*. Cambridge: Cambridge University Press.

Tobert, N. 1988. *The Ethnoarchaeology of the Zaghawa of Darfur (Sudan). Settlement and Transcience*. Cambridge Monographs in African Archaeology 30. Oxford: BAR International Series 445.

Tobert, N. 2000. *Anegondi. Architectural Ethnography of a Royal Village*. New Delhi: Manohar [for] American Institute of Indian Studies.

Todd, I. A. 1993. “Kalavasos-Laroumena: test excavations of a Middle Bronze Age settlement.” *Report of the Department of Antiquities*, Cyprus: 81-96.

Todd, I. A., M. Hadjicosti, C. Xenophontos, and E. Herscher. 1991. “Excavations at Sanidha 1990.” *Report of the Department of Antiquities*, Cyprus: 37-74.

Todd, I. A., D. Pilides, and M. Hadjicosti. 1993. “Excavations at Sanidha 1992.” *Report of the Department of Antiquities*, Cyprus: 97-146.

Todd, I. A., D. Pilides, M. Hadjicosti, and J. S. Smith. 1992. “Excavations at Sanidha 1991.” *Report of the Department of Antiquities*, Cyprus: 75-112.

Trova, V. 1989. *Domestic Space Organisation in Pobia: Changes in the Spatial Culture of a Greek Village in Crete*. Unpublished Masters Dissertation. London: Bartlett School of Architecture, University College London.

Tubiana, M.-J. 1985. *Des Troupeaux et des Femmes. Mariage et Transferts de Biens Chez les Beri (Zaghawa et Bideyat) du Tchad et du Soudan*. Paris: Editions L'Harmattan.

Verdon, M. 1979. “The stem family: towards a general theory.” *Journal of Interdisciplinary History* 10(1): 87-105.

Verdon, M. 1980. “Shaking off the domestic yoke, or the sociological significance of residence.” *Comparative Studies in Society and History* 22(1): 109-32.

Verdon, M. 1998. *Rethinking Households. An Atomistic Perspective on European Living Arrangements*. London and New York: Routledge.

Verhoeven, M. 2005. "Ethnoarchaeology, Analogy, and Ancient Society." In *Archaeologies of the Middle East. Critical Perspectives*, edited by S. Pollock and R. Bernbeck, pp.251-270. Oxford: Blackwell.

Vermeule, E. and F. Z. Wolsky. 1990. *Toumba tou Skourou: A Bronze Age Potter's Quarter on Morphou Bay in Cyprus*. Cambridge, Boston: Harvard University, Boston Museum of Fine Arts.

Walicka-Zeh, R. 2000. *Building Practice and Cultural Space Amongst the Bamana, Senufo and Bozo of Mali: an Ethnoarchaeological Study.* Unpublished PhD thesis. London: University of London.

Wall, R., J. Robin, and P. Laslett. 1983. *Family Forms in Historic Europe*. Cambridge: Cambridge University Press.

Wallace-Hadrill, A. 1994. *Houses and Society in Pompeii and Herculaneum*. Princeton, New Jersey: Princeton University Press.

Walls, N. 1996. "Ugaritic documents from Ugarit." In *Near Eastern and Aegean Texts from the Third to the First Millennium BC*, edited by A. B. Knapp, pp. 36-41. New York: Greece and Cyprus Research Centre.

Warrick, G. 1996. "Evolution of the Iroquoian longhouse." In *People Who Lived in Big Houses: Archaeological Perspectives on Large Domestic Structures*, edited by G. Coupland and E. B. Banning, pp. 11-25. Madison, Wisconsin: Prehistory Press.

Watson, P. J. 1979. *Archaeological Ethnography in Western Iran*. Tucson: Wenner-Green, University of Arizona Press.

Webb, J. M. 1995. "Abandonment processes and curate/discard strategies at Marki-Alonia, Cyprus." *The Artefact* 18: 64-70.

Webb, J. M. 1998. "Lithic technology and discard at Marki, Cyprus. Consumer behaviour and site formation in the prehistoric Bronze Age." *Antiquity* 72: 796-805.

Webb, J. M. 1999. *Ritual Architecture, Iconography and Practice in the Late Cypriot Bronze Age*. Jonsered: Paul Åströms Förlag.

Webb, J. M. 2002. "Engendering the built environment: households and community in prehistoric Bronze Age Cyprus." In *Engendering Aphrodite. Women and Society in Ancient Cyprus*, edited by D. L. Bolger and N. Serwint, pp. 87-102. Boston, MA: American Schools of Oriental Research.

Webb, J. M. 2007 "Tracking gender and technology in prehistory: a case study from Bronze Age Cyprus". *Iris: Journal of the Classical Association of Victoria* 20: 20-29.

Webb, J. M. 2009 "Keeping house: our developing understanding of the Early and Middle Cypriot household (1926-2006)." *Medelhavsmuseet. Focus on the Mediterranean* 5 *(Finds and Results from the Swedish Cyprus Expedition 1927–1931: A Gender Perspective)*: 255–267. Stockholm: Medelhavsmuseet.

Webb, J. M. and D. Frankel. 1999. "Characterizing the Philia facies: material culture, chronology, and the origin of the Bronze Age in Cyprus." *American Journal of Archaeology* 103: 3-43.

Weinberg, S. S. 1952. "Kourion-Bamboula: the Late Bronze Age architecture." *American Journal of Archaeology* 56: 178.

Weinberg, S. S. 1982. "Episkopi Bamboula: notes on the architecture." In *An Archaeological Guide to the Ancient Kourion Area and the Akrotiri Peninsula*, edited by H. W. Swiny, pp. 45-48. Nicosia: Department of Antiquities.

Weinberg, S. S. 1983. *Bamboula at Kourion: the Architecture*. Philadelphia: The University Museum, University of Pennsylvania.

Whitelaw, T. M. 2001. “From sites to communities: defining the human dimensions of Minoan urbanism.” In *Urbanism in the Aegean Bronze Age*, edited by K. Branigan, pp. 15-38. Sheffield: Sheffield Academic Press.

Wiessner, P. 1974. “A functional estimator of population from floor area.” *American Antiquity* 39(2): 343-50.

Wilk, R. 1983. “Little house in the jungle: the causes of variation in house size among modern Kekchi Maya.” *Journal of Anthropological Archaeology* 2: 99-116.

Wilk, R. and R. Netting. 1984. “Households: changing forms and functions.” In *Households. Comparative and Historical Studies of the Domestic Group*, edited by R. Netting, R. Wilk, and E. Arnould, pp. 1-27. London: University of California Press.

Wilk, R. and W. L. Rathje. 1982. “Household archaeology.” *American Behavioral Scientist* 25(6): 617-39.

Wilk, R. R. 1989. *The Household Economy: Reconsidering the Domestic Mode of Production.* Boulder, Colorado, London: Westview Press.

Wolf, A. P. 1984. “Family life and the life cycle in rural China.” In *Households. Comparative and Historical Studies of the Domestic Group*, edited by R. Netting, R. Wilk, and E. Arnould, pp. 279-97. London: University of California.

Wright, G. R. H. 1992. *Ancient Building in Cyprus*. Leiden: E. J. Brill.

Wylie, A. 1985. "The reaction against analogy." In *Advances in Archaeological Method and Theory* 8, edited by M. B. Schiffer pp. 63-111. London: Academic Press.

Yalcin-Heckmann, L. 1991. *Tribe and Kinship Among the Kurds*. Frankfurt am Main, Germany: Peter Lang.

Yanagisako, S. Y. 1979. “Family and household: the analysis of domestic groups.” *Annual Review of Anthropology* 8: 161-205.

Zorn, J. R. 1997. “Tell en-Nasbeh.” In *The Oxford Encyclopedia of Archaeology in the Ancient Near East. Volume 4*, edited by E. Meyers, pp. 101-03. New York: Oxford University Press.